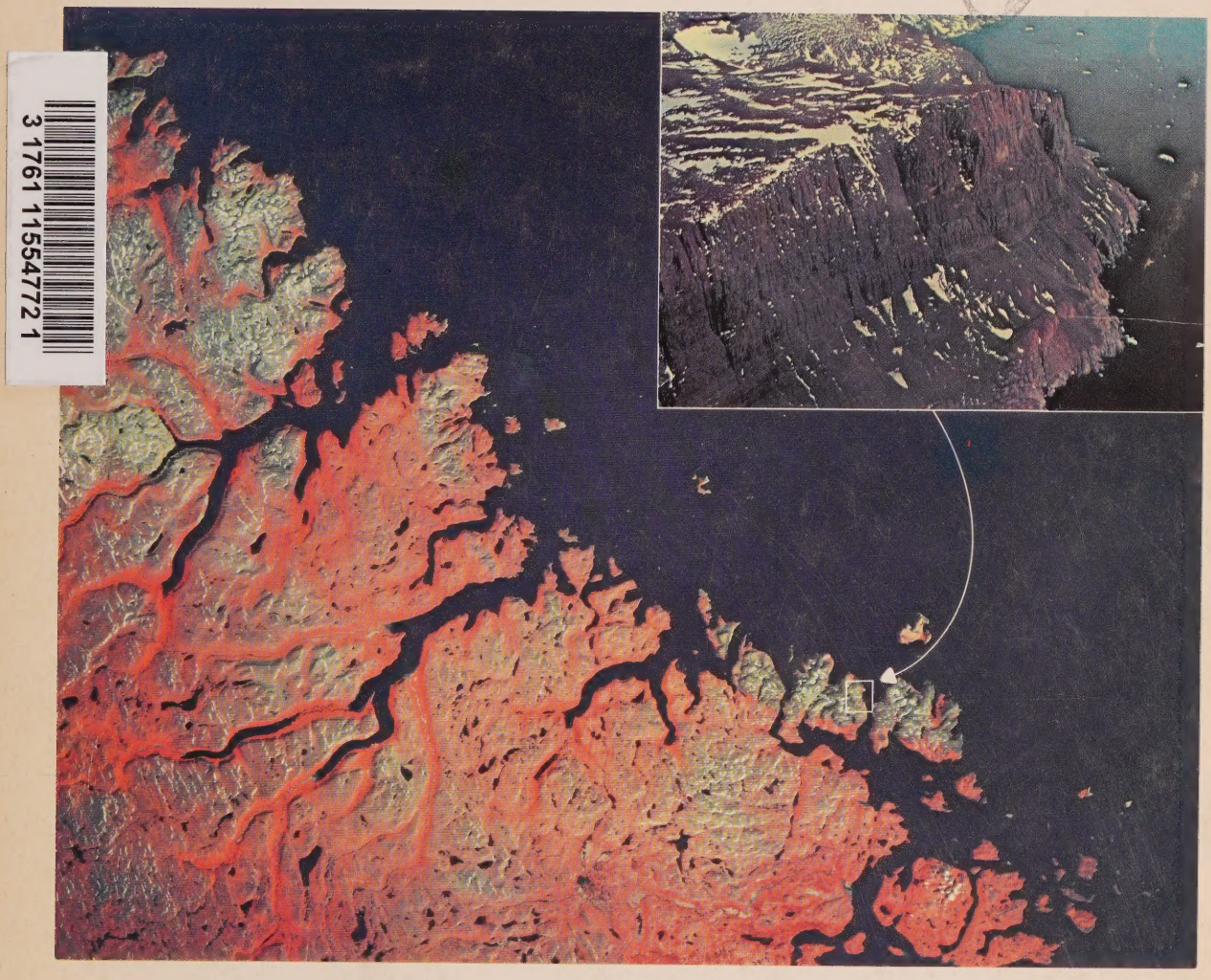
THE ECOLOGICAL LAND CLASSIFICATION OF LABRADOR; A RECONNAISSANCE



ECOLOGICAL LAND CLASSIFICATION SERIES, NO. 4

Front Cover:

Landsat image taken 21 July, 1975 (20180-14390; picture center 1219; bands 4, 5 and 7). Napaktok Bay is centered with Hebron Fjord appearing in the upper part of the image and the Kaumajet Mountains appearing in the lower part of the image. The insetted oblique photograph is of the Kaumajet Mountains.

ECOLOGICAL LAND CLASSIFICATION OF LABRADOR

LANDS DIRECTORATE (ATLANTIC REGION)
ENVIRONMENTAL MANAGEMENT SERVICE
FISHERIES & ENVIRONMENT CANADA
HALIFAX, NOVA SCOTIA

by
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N. A. PROUT
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Ecological Land Classification Series, No. 4

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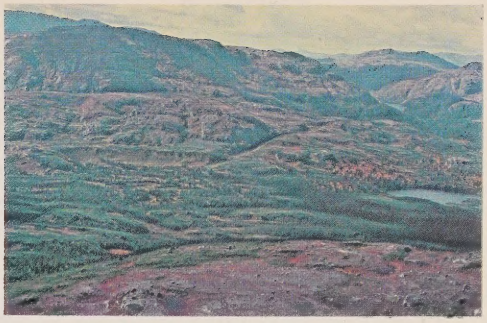

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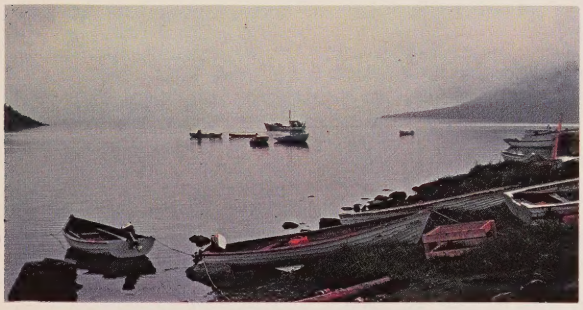

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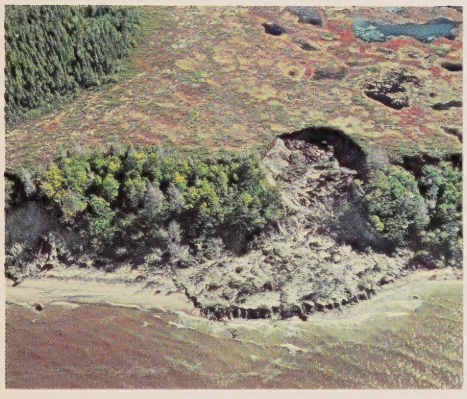

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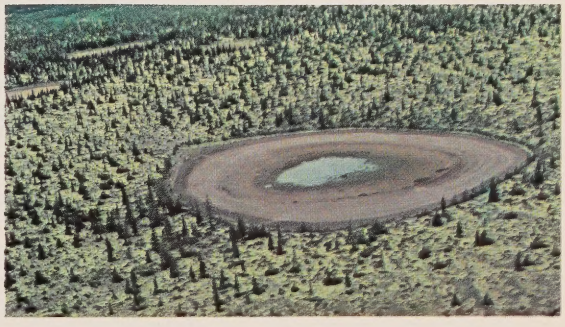

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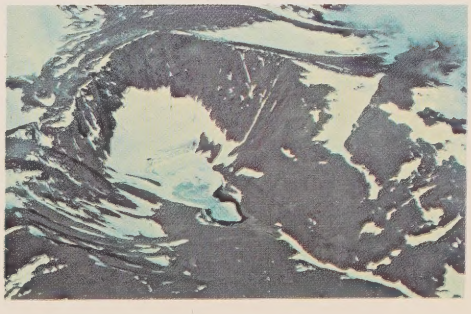


Illustrations:

a. Part of the Canada Geese flock which breeds along the shore of Groswater Bay.

b. Mealy Mountains (Region U) Photographed from the headwaters of the English River.

c. Rigolet's harbour is one of many along Labrador's coast.

d. *Iris versicolor* one of the showiest flowers growing along the coast of Labrador.

e. Fine marine sediments are prone to slumping as in this case where they are overlain by organics (string bog) along the shore of Lake Melville (Region T.)

f. The few lakes in the extensive marine lain sand deposits along Porcupine Strand (Region W) dry up as the water table drops in the fall.

g. Muskrat Falls (Region T) is a potential site for hydro development.

h. A frozen lake (tarn) in the higher elevations of the Torngat Mountains (Region C) photographed in early July.

ABSTRACT

A reconnaissance survey of the physical and biological characteristics of Labrador was initiated in the spring of 1976. Twenty-seven ecological Land Regions with associated Land Districts were recognized and described utilizing visual interpretive information obtained from Landsat imagery. These data were augmented by available literature, two Argus reconnaissance flights provided by the Department of National Defence, selected aerial photography and limited ground checks.

General geographical characteristics of Labrador are presented followed by the methodology and procedures involved in the classification and mapping. Land Regions are described with respect to location, climate, physiography and vegetation. The resource development implications of these interrelating attributes are briefly outlined. Land District descriptions are tabulated as an appendix. A map of the ecological Land Regions and Districts at a scale of 1:1,000,000 is enclosed at the end of the report.

RESUME

Au printemps de 1976, on a entrepris un levé de reconnaissance portant sur les caractéristiques physiques et biologiques du Labrador. En utilisant les renseignements provenant de l'analyse visuelle d'images Landsat, on a pu distinguer et décrire vingt-sept Régions écologiques et leurs Districts écologiques. On a augmenté ces données en dépouillant les études existantes, en effectuant deux vols de reconnaissance à bord d'un avion Argus fourni par le ministère de la Défense nationale, en interprétant des photographies aériennes sélectives et en exécutant un nombre limité de vérifications au sol.

Le rapport présente d'abord les caractéristiques géographiques générales du Labrador, puis les méthodes et les procédures qu'on a adoptées pour la classification et l'établissement des cartes. On décrit la position, le climat, la physiographie et la végétation des Régions écologiques, et on expose brièvement les répercussions que ces facteurs étroitement leés ont sur la mise en valeur des ressources. En appendice, on présente, sous forme de tableaux, la description des districts écologiques. A la fin du rapport, on fournit une carte de 1:1,000,000 des Régions et des Districts écologiques.

ACKNOWLEDGEMENTS

This study would not have been completed without the assistance and close cooperation of a number of agencies and personnel. The Department of National Defence in particular, gave us an otherwise unattainable opportunity to rapidly gain first hand knowledge of Labrador's varied landscapes. Specifically, squadrons 405 and 415 manned two marathon Argus flights.

Parks Canada interest and support is recognized as a catalyst for the completion of the study. The Newfoundland Department of Forestry and Agriculture provided aerial photographs, use of vehicles and field equipment.

We are grateful to Mr. R. Bowlby for his assistance in the basic research, field work and preliminary cartography.

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

- location maps of each Region and a representative photograph are included with each Regional Description (see Table of Contents).

Figure 1: Location of the study area, Labrador, in relation to Canada.

INTRODUCTION

Although most of Labrador lies to the south of 60° N latitude, it has characteristics similar to the more northerly Yukon and Northwest Territories. A major part of its natural resources occurs within a cold, inhospitable and relatively fragile environment. Development in Labrador for hydroelectric expansion, mining, forestry and offshore oil and gas appears to be inevitable. Similar projects undertaken in the Territories and more resilient southern ecosystems have a history of detrimental side effects. Sensitive terrain and the higher cost of remote development are not the only considerations; there are concerns dealing with the social and economic welfare of the native inhabitants, as well as the impact on wildlife. Sound planning and the assessment of potential impact on the environment of any project thus becomes crucial.

In order to properly determine potential effects of development, The Newfoundland Department of Forestry and Agriculture along with the Lands Directorate perceived the need for pertinent baseline data for all of Labrador. This project was undertaken specifically to bring under one cover and on the map, at a reconnaissance level, a description and depiction of Labrador's varied landscapes and their inherent resources.

Several methodologies exist to obtain essential data on various resource sectors. The Canada Land Inventory developed guidelines for a biophysical land classification system that appeared to be suitable for classifying large areas of inaccessible land (ed. Lacate, 1969). This approach, although somewhat modified, was found to be useful in the small-scaled ecological classification of the Yukon (Oswald and Senyk, 1977). A description of this hierarchial system is included within the methodology section of this report.

The ecological classification of Labrador concentrated on the determination and description of Land Regions and Land Districts. With this background, critical areas in terms of environmental sensitivity, may be pinpointed within Labrador. Accordingly, future monies and manpower may be concentrated on the detailed study of these more fragile areas to ensure an adequate data base upon which various projects may be assessed.

The landscapes of Labrador range from rugged mountains to flat marine plains; climate is as varied. Altitude, latitude and proximity to the Labrador Sea all affect regional climate and consequently the vegetation distribution. Delineation of the Ecological Land Regions was carried out on the basis of perceived differences in vegetation utilizing Landsat imagery. The Regions were subdivided into Ecological Land Districts on the basis of physiographic homogeneity. These Region and District boundaries are approximations, in that they are subject to revision as the ecology of Labrador becomes better known.

The descriptions that follow present a broad overview of the climate, physiography, water, soils and vegetation of Labrador. This is followed by a discussion on classification methodology and description of the individual Land Regions. A listing of Land Districts with relevant resource implications is appended. A 1:1,000,000 map depicting the various Land Regions and Districts is included with this report.

The Ecological Land Regions and Districts of Labrador provide relevant baseline data required for ecological land planning at a regional level. They are a foundation on which may be superimposed pertinent social and economic concerns of any considered development.

ECOLOGICAL LAND CLASSIFICATION OF LABRADOR

GENERAL DESCRIPTION OF LABRADOR

(I) CURRENT STATUS

The mainland part of the province of Newfoundland and Labrador (figure 1) has a total area of approximately 288,000 sq. km. It is sparsely inhabited and has a diverse physical and biological makeup. Population centres have evolved at various places along the Labrador coast. Inland, newer communities such as Wabush and Labrador City have been established at sites of present mining activity. The twim towns of Goose Bay and Happy Valley serve as the major import-export centre of goods and services for Labrador. In total the population of Labrador does not exceed 35,000.

The rugged terrain and the great distance between settlements has limited the development of transportation corridors. Presently, a sometimes impassable road exists between Goose Bay and Churchill Falls. Otherwise, road travel is limited to local traffic, A continuing program of microwave installations will soon bring television and radio to most of the isolated coastal communities. Coastal freighters are kept busy during the ice-free season carrying various necessities to the local populace before winter sets in. Air service is maintained on a year round basis, weather permitting. Thus, although Labrador only extends to approximately 60° north latitude, lying south of both the Yukon and the Northewest Territories, it has many of the same problems when considering development of resource potential.

(II) CLIMATE

The climate of this large area is influenced by the following factors: 1) Labrador's geographical position 2) altitude, 3) coastal exposure and marine influences. Although recording stations are few, climatic maps are available from the Atmospheric Environment Services as part of annual Ice Summary and Analysis Reports (anonymous, 1965 to 1971). Peach, (1975) has produced maps depicting climate as it influences recreational potential within Labrador (Figures 2, 3, 4). Normal winters are long and harsh with snow prevalent from November to early June. In the Torngat Mountains, snow may persist from late September to early July. The coastline is generally ice-covered for five months. Summers tend to be short and temperatures are lower along the coast because of proximity to the cold Labrador current. Coastal fog is common.

A maritime climate with temperature ranges of 22° C contrasts with the continental climate of the interior where temperature has an average annual range of 33°C degrees. The mean annual temperatures in Labrador are between 5°C and 0°C dependent on latitude, elevation and proximity to the area. Mean annual percipitation ranges from 600 mm at northern latitudes to 1200 mm at the Quebec-Labrador boundary. The prevailing climate is a distinct limiting factor for vegetation.

(III) PHYSIOGRAPHY

Physiography and landforms of Labrador-Ungava were generalized by Hare (1969) in "A Photo-Reconnaissance Survey of Labrador-Ungava". Surficial geology maps have been produced by the Geological Survey of Canada for parts of southern Labrador (Fulton, R. *et al* 1969) and the Province of Newfoundland and Labrador has published a geology map for all of Labrador (Greene, 1974). Bostock (1970) includes Labrador in his physiographic map of Canada (Figure 5). The McGill University Sub-Arctic Research Station has conducted geomorphic studies in various parts of Labrador (see references).

Labrador's underlying structure is a tilted plateau elevated in the southwest and sloping to lowlands along the coast. In the northeast (north of Nain) a mountain massif rises above the plateau. This includes the Kaumajet, Kiglapait and Torngat Mountains with slopes rising from the sea and summits near the coast as high as 1500 m. Two other distinct upland areas are the Benedict and Mealy mountains (north-east and south of Lake Melville respectively.)

The configuration of the Precambrian plateau, part of the Canadian Shield, has been modified by uplift, folding, glaciation and erosion. This has resulted in a heterogeneous surface ranging from undulating bedrock uplands to scoured areas where lakes and bogs have developed in depressions. In western Labrador folded Precambrian sediments form a structurally controlled system of valleys and ridges. There, iron ore is extracted at several sites including Knob Lake and Wabush. Faults occur in many locations in Labrador; examples are the Fraser River and the northeast scarp of the Mealy Mountains. Evidence of Pleistocene continental glaciation may be derived from a variety of forms. Most widespread in Labrador are deposits of unstratified glacial drift which appear as ground moraine of uneven distribution. Depositional forms such as

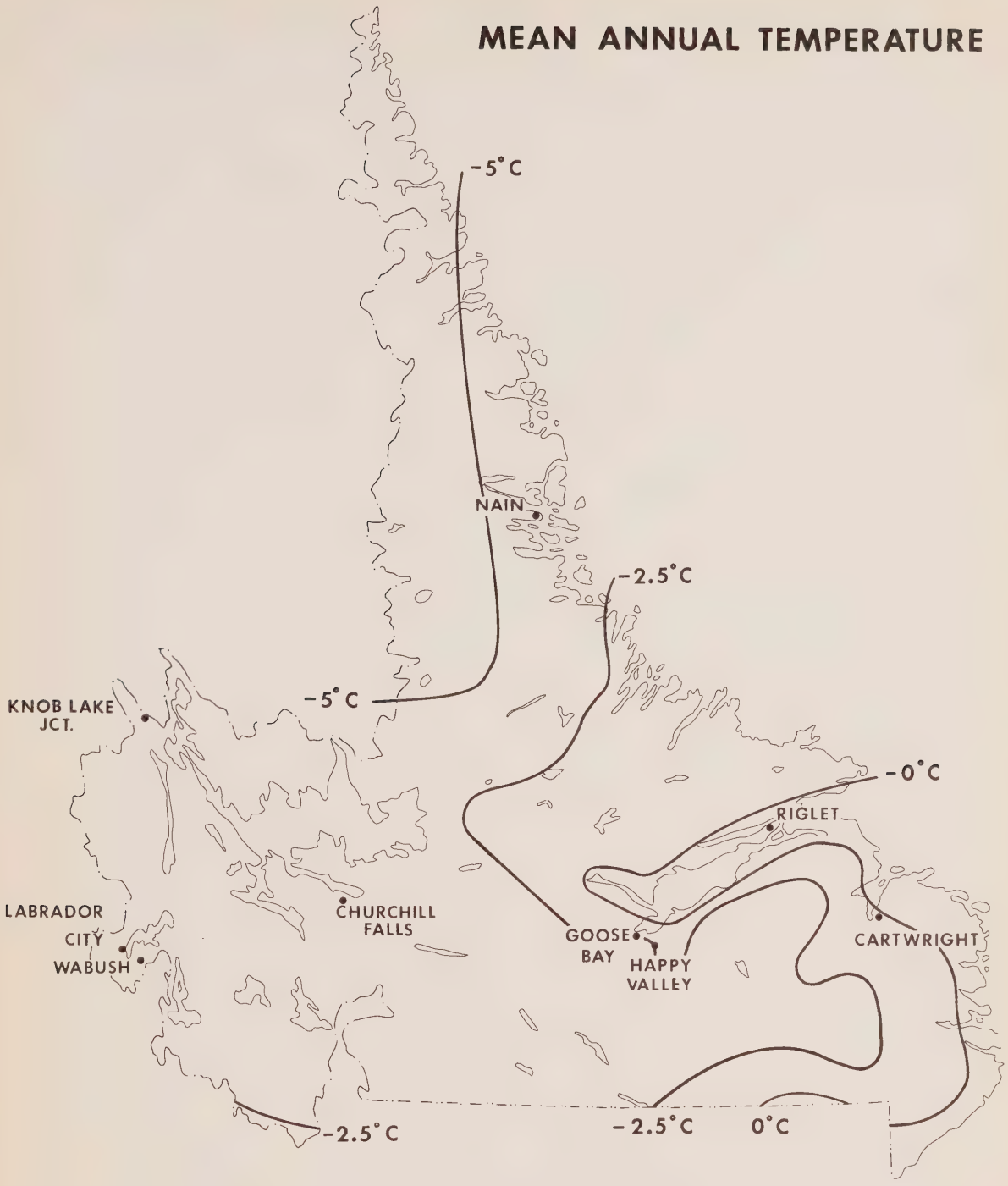


Figure 2: Annual mean air temperature isotherms (Peach, 1975)

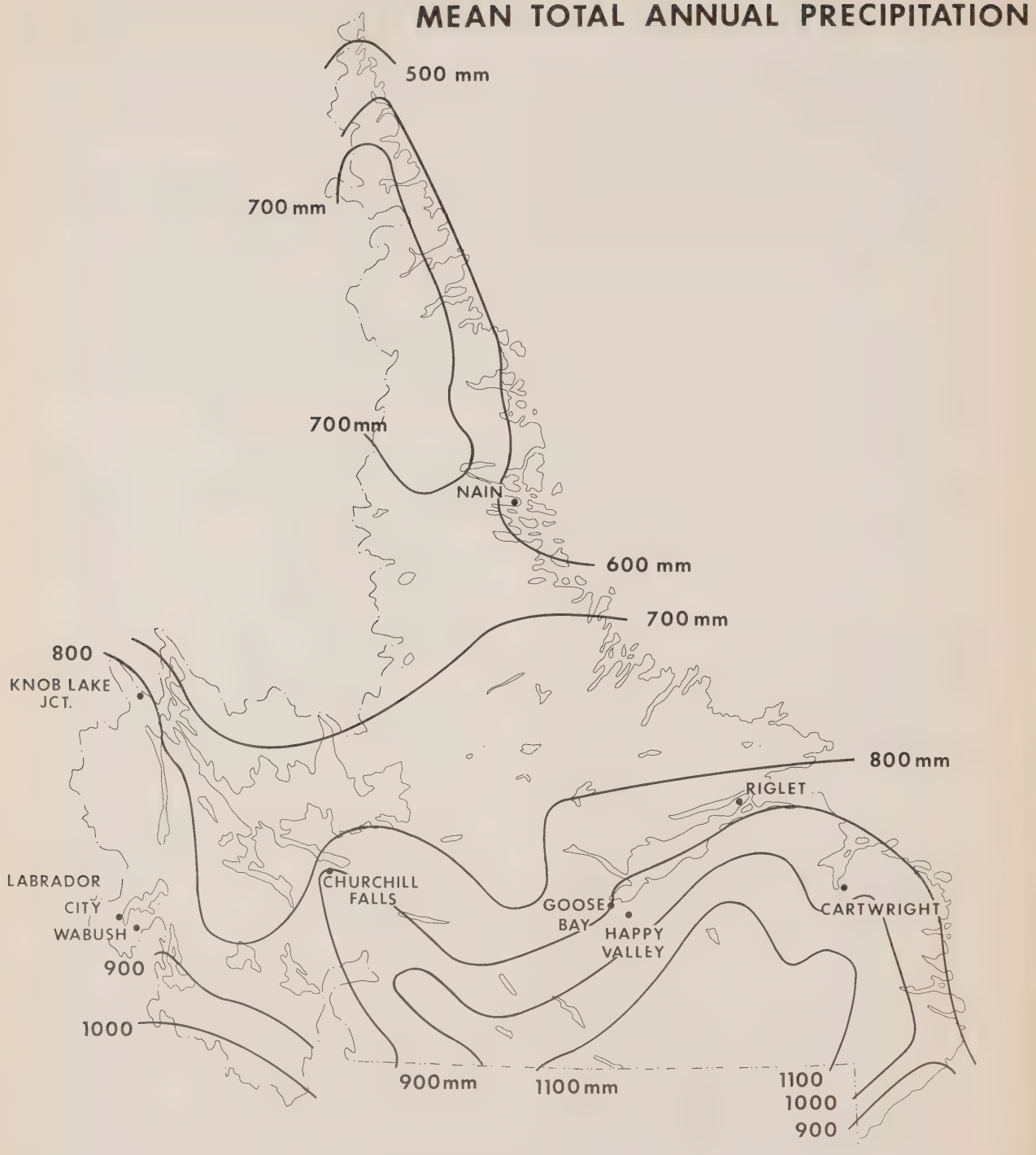


Figure 3: Annual mean precipitation isohyets, (Peach, 1975)

Figure 4: Annual mean snowfall (Peach, 1975)

Figure 5: Physiographic subdivisions according to Bostock (1970)

drumlins, eskers and outwash deposits are numerous. In the mountainous areas, remnants of alpine glaciation remain as cirque and arête features.

The coastline of Labrador has many inlets and islands. In the northern areas, there are fjords which are several kilometres long and continue inland as lengthy U-shaped valleys. Hamilton Inlet is the most prominent inlet of the Labrador coast, extending approximately 240 km. inland. The windswept and barren coast is generally exposed to cold, moisture laden winds; only the long, narrow inlets provide protected sites.

(IV) WATER

Labrador's abundance of water is in the form of bogs, lakes, streams, and rivers. The western boundary runs along watershed divides between Labrador and Quebec and the majority of the basins drain into the Atlantic Ocean. In western and southern Labrador, large complexes of sphagnum bog and open water occur. These give way to numerous lake systems which from headwaters for large rivers such as the Churchill (headwaters in the west) and the Eagle (headwaters south of the Mealy Mountains). Hydroelectric development has already occurred at Churchill Falls on the upper reaches of the Churchill River and is proposed downstream in the area of Gull Island. River systems in southern Labrador with future development prospects (of particular note; Romaine, Natahquan, Little Mecatina, St. Augustine and St. Paul) all flow into the Gulf of St. Lawrence.

(V) SOILS

Much of northern Labrador is primarily a rockland with limited soil development. Coastal barrens with lithics and regosols occur along much of Labrador's coast. The Mealy Mountains south of Hamilton Inlet and other less elevated southern hills have similar minimal soil cover. Frost action is intense. Talus slopes are common and felsenmeer is prevalent.

Humo-ferric and ferro-humic podzols characterize much of the morainic, outwash and marine deposits in central and southern Labrador. Hardpan development within the soil profile is frequent. Organic soils are common in lowland areas and poorly drained marine deposits. String and blanket bogs sometimes cover vast expanses of land as typified by sections of the Eagle Plateau Land Region. Fibrisols and mesisols dominate. Localized palsa bogs have been recorded on marine deposits as far south as the extreme southeast corner of Labrador.

In the areas without a data base, permafrost occurrences are assumed to coincide with certain mean annual air temperature isotherms. Two zones of permafrost are recognized; discontinuous (occurring between the 0°C and -10°C MAT isotherms) and continuous (occurring in areas colder than -10°C). The former is subdivided into two subzones; scattered (0°C to °C) and widespread (-4°C to -10°C). All of these zones occur in Labrador (figure 6) (Brown, in press.)

Gentle upland slopes and alpine meadows are characterized by turbated dystric or eutric brunisols. Coastal beach ridges are subjected to constant wind action, and blowouts are common within coarse textured marine deposits. As well, dune development has occurred in several areas along the coast. Stablized dunes show podzolic development whereas regosols typify dune systems.

Regosolic development is encountered on floodplains. Local seepage slopes, the margins of bogs and small depressions are often marked by gleysols.

(VI) VEGETATION

The vegetation of Labrador lies within both the Boreal Forest Region and Tundra Region as classified by Rowe (1972) (figure 7). Northern Labrador, the Harp Lake plateau and the Mealy Mountains are the areas which fall within the Tundra Region. Lichens, mosses and low lying shrubs are the dominant plant forms there. Vegetation on hills is commonly composed of alpine bearberry *(Arctostaphylos alpina)* and willows *(Salix arctica, S. uva-ursi)* being most prevalent. Moss dominates sites with a damp and foggy climate and lichens, colonize rock. Low lying terrain is covered with heath-like vegetation dominated by crowberry *(Empetrum nigrum)* and blueberries *(Vaccinium uliginosum, V. vitis-idae).* Grasses and sedges are mixed with these shrubs to form expanses of vegetation interrupted by bare rock or snow patches.

Along much of the exposed coastline of Labrador, crowberry-dominated barren lands prevail. Tree growth in these areas are minimal except in sheltered valleys and side slopes. Inland, within central and southern Labrador, good forest growth is restricted to well-drained alluvial bottomlands. White spruce *(Picea glauca)* and balsam fir *(Abies balsamea)* of merchantable size and quality mixed with black spruce *(Picea mariana)* occupy these sites. Lichens *(Cladonia spp),* in association with both open-grown white and black spruce, cover much of the upland till and outwash soils. White birch *(Betula papyrifera)* and trembling aspen *(Populus tremuloides)* may proliferate after a

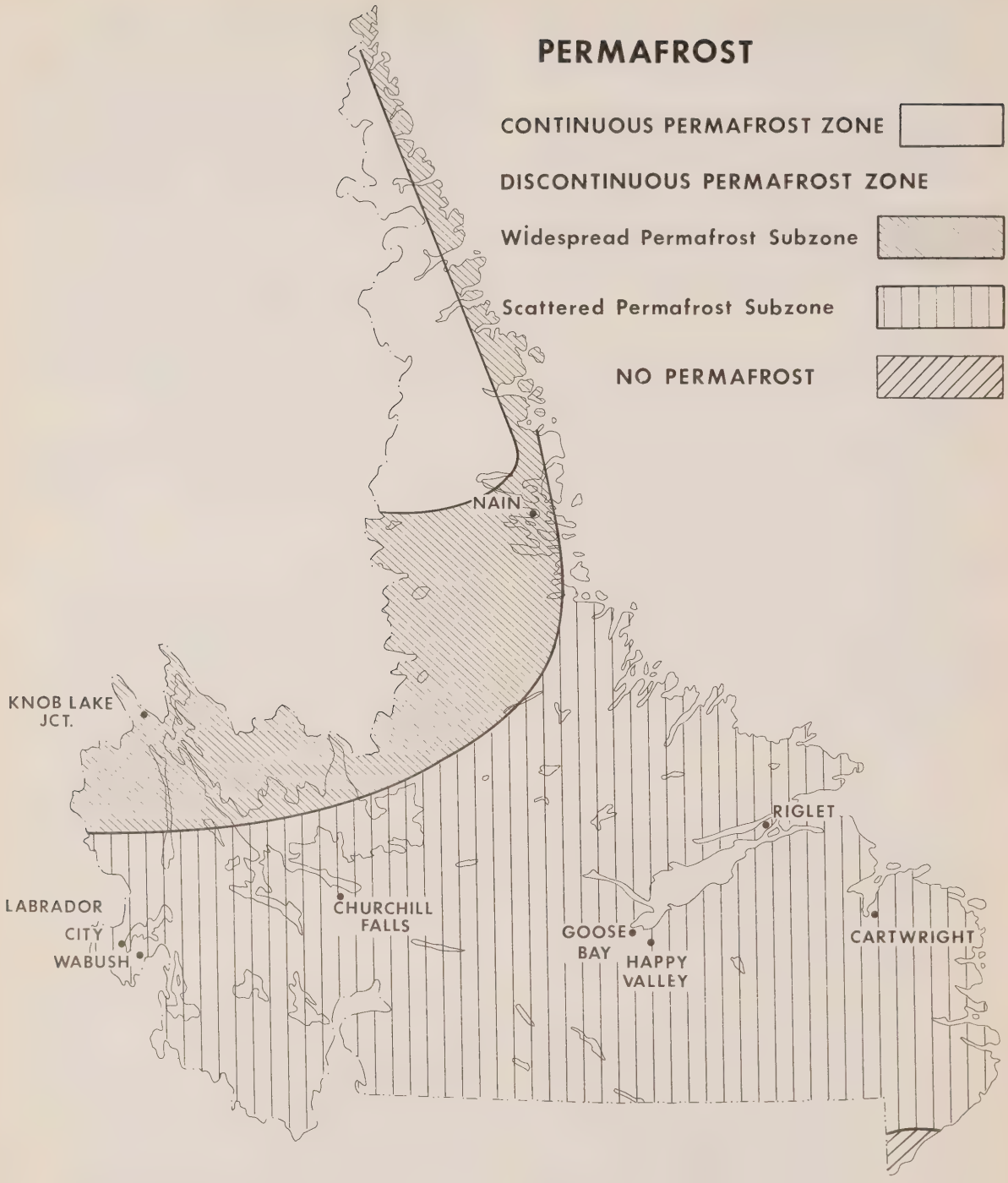


Figure 6: Permafrost zones and subzones (Brown, in Press)

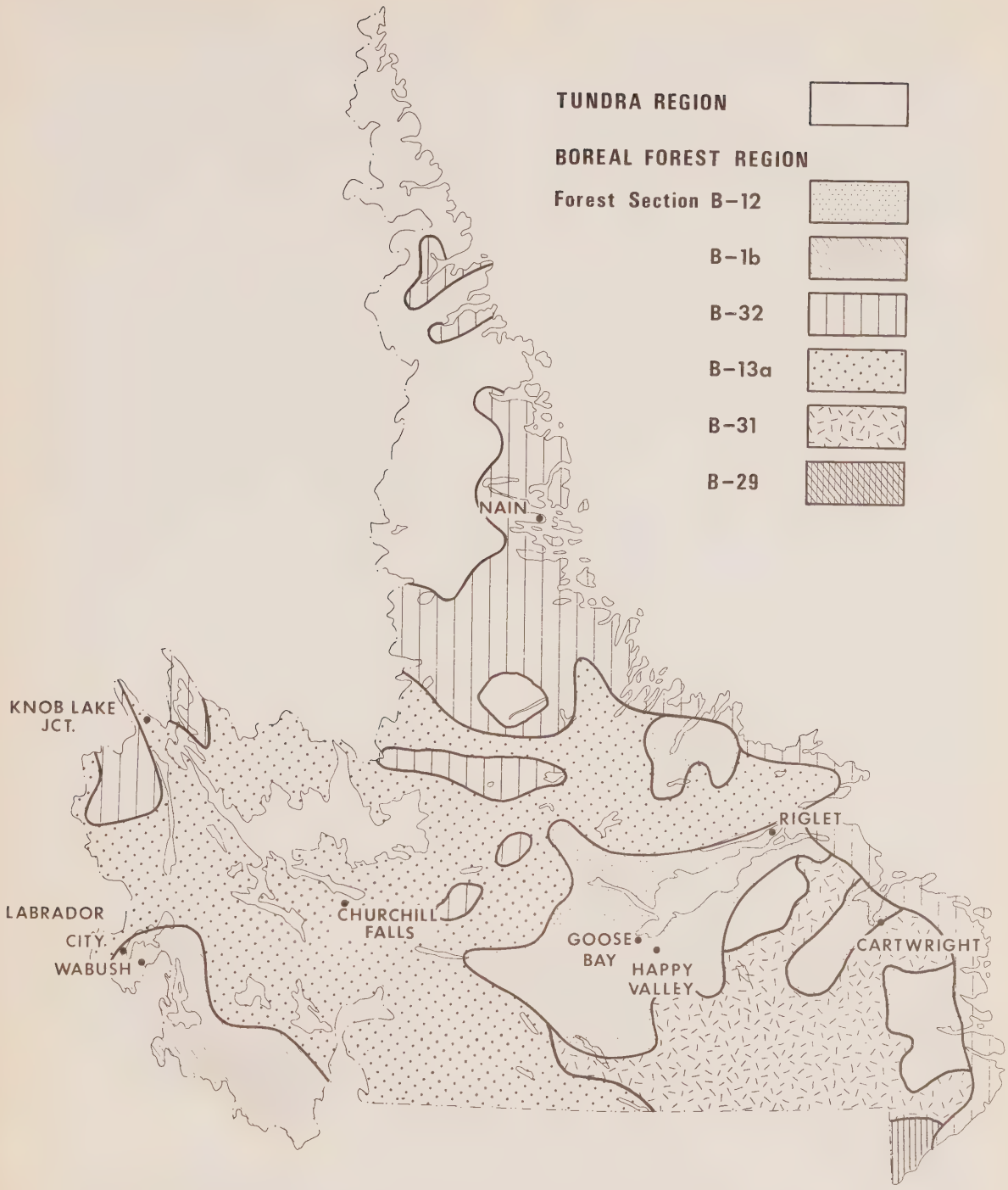


Figure 7: Forest regions according to Rowe (1972)

burn, but do not exist as pure stands once softwoods are reestablished. Eastern larch *(Larix laricinia)* is prevalent to tree line.

(*Sphagnum* spp.) bog development is extensive in areas of poor drainage. Common associates include Labrador tea (*Ledum groenlandicum*) bog laurel (*Kalmia polifolia*), and bakeapple *(Rubus chamaemorus).* Willows *(Salix* spp), dwarf birch *(Betula glandulosa),* and speckled alder *(Alnus rugosa)* occupy disturbed sites throughout forested areas of Labrador.

Besides Rowe's Forest Regions of Canada, other researchers have classified the vegetation of Labrador for varying purposes. These include: forest types and treelines, Hustich (1949), covertypes and zonal subdivisions, Hare (1959), forest vegetation types with respect to species and forest zones with respect to productivity and economic potential, Wilton (1965), bog types, Allington (1958).

METHODOLOGY

Proper resource management and planning require knowledge of land and water characteristics as well as their biological and physical inter-relationships. One approach that gathers the base information to allow such synthesis to take place is Ecological Land Classification as discussed in the guidelines compiled by Lacate (1969). Physical and biological features are identified, described and inter-relationships are used to determine the delineation of land units. Dependent on the purpose of the classification and the detail required, differing scales of mapping which reflect the desired end result are used.

Units of Classification	Practicable Scale of Mapping
Land Region	1:1,000.000 or smaller
Land District	1:500,000 - 1:1,000,000
Land System	1:125,000 - 1:250,000
Land Type	1:10,000 - 1:20,000

This hierarchial system of land classification is particularly suited to the mapping of large and inaccessible land areas. Those sites that warrant further detailed examination for a particular purpose may then be determined. The Land Region represents an area of land characterized by a distinctive regional climate as expressed by vegetation. Within Land Regions, Land Districts depict areas of land characterized by a distinctive pattern of relief, geology, geomorphology and associated regional vegetation. The Land System depicts further detail by defining units having recurring patterns of landforms, soils and vegetation. Land Type mapping is very detailed and warranted only for actual site planning purposes rather than reconnaissance. It delineates a particular parent material with a fairly homogeneous soil combination and chronosequence of vegetation.

For Labrador as elsewhere regional planning alternatives cannot be apparent without a prior general reconnaissance of the physical and biological characteristics of the area. To accomplish a reconnaissance within the time span of one year, Land Region and Land District mapping at a 1:1,000,000 scale was embarked upon.

To facilitate such small scale mapping at a minimal cost, Landsat imagery were used. Standard 1:50,000 black and white panchromatic photographs were utilized as backup where required (figure 8). For reconnaissance ecological classification purposes, Landsat imagery have several attributes. The orbital characteristics of the satellites provide repetitive coverage of a given area every nine days. The side-lap of images of sequential orbits covering Labrador ranges from approximately 45% in the south, to 57% at Cape Chidley (figure 9). This overlap increases the probability of all areas being imaged, at least once without cloud cover. An attempt was made to obtain early and late summer and winter frames for the whole of Labrador. All areas were represented without cloud obscuration for at least two dates. Such seasonal coverage is a definite asset when interpreting climatic and vegetative characteristics of an area.

The regional perspective of land/water resources and their distribution requires interpretation and identification of features by analyzing tone and spatial patterns which appear on the Landsat images. The Landsat satellites sense reflected wavelengths which characterize a wide range of environmental features. The data received represent part of the reflected portion of the electromagnetic spectrum divided into four bands: Band 4-green wavelengths, Band 5-red wavelengths and Bands 6 and 7 are in the near infrared range. The resultant images in a standard size transparency format can be visually interpreted. Black and white transparencies of each of these bands and color composites of Bands 4, 5 and 7 at a scale of 1,000,000 were used for delineation between units as well as for interpretation within units. (figure 10).

MAPPING VERIFICATION AND REVISION

For the preliminary mapping, the boundaries of Regions and Districts were drawn on clear plastic overlaying the satellite images. These lines were then transferred onto preliminary maps at scales of 1:1,000,000 and 1:250,000. Available references and selected aerial

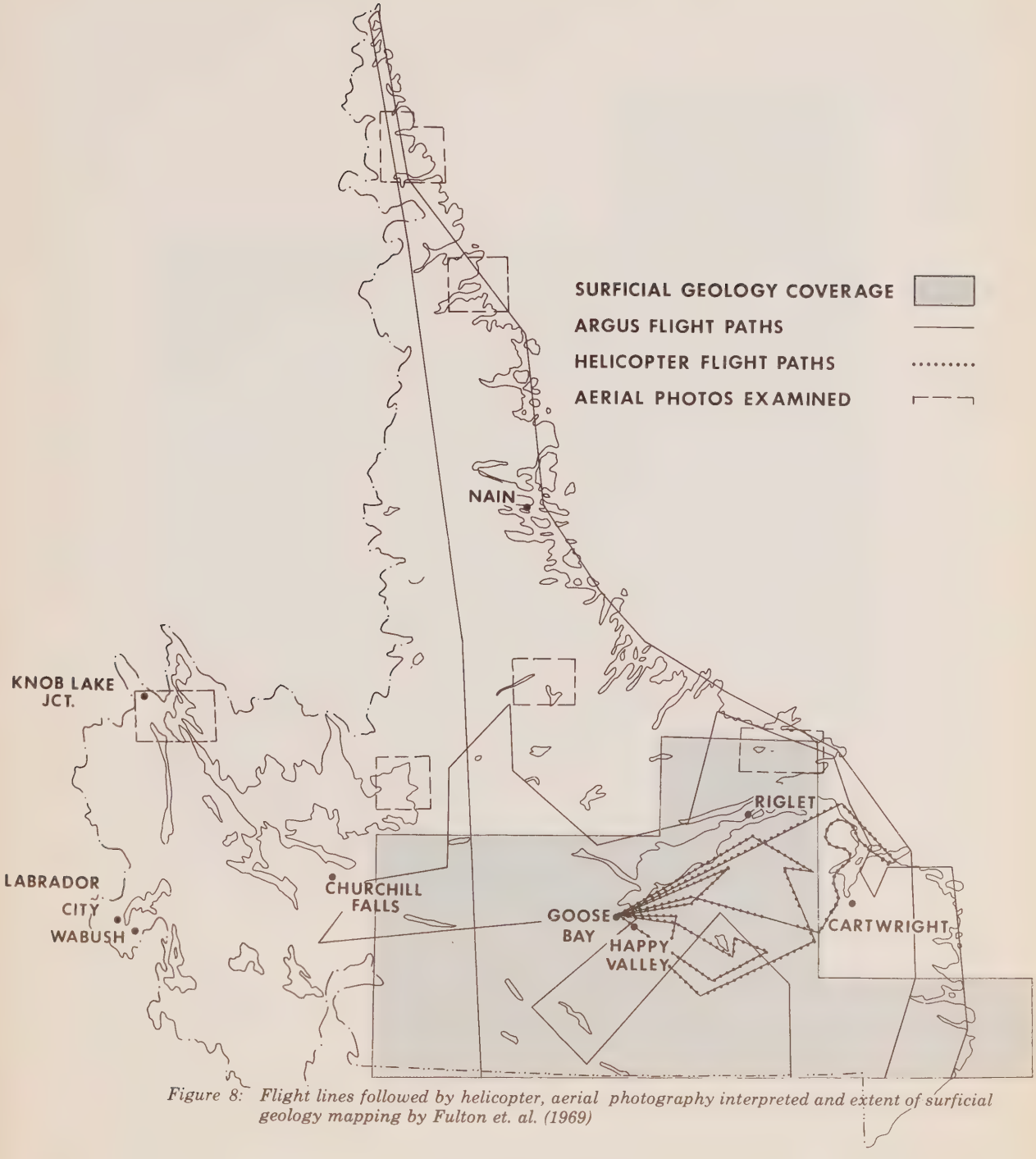


Figure 8: Flight lines followed by helicopter, aerial photography interpreted and extent of surficial geology mapping by Fulton et. al. (1969)

Figure 9: The thirty picture centres indicated represent the Landstat coverage examined during the mapping program. The background is a satellite imagery mosaic of Labrador, part of Satellite Image Map Sheet No. 7, produced by Topographic Survey, Department of Energy, Mines and Resources

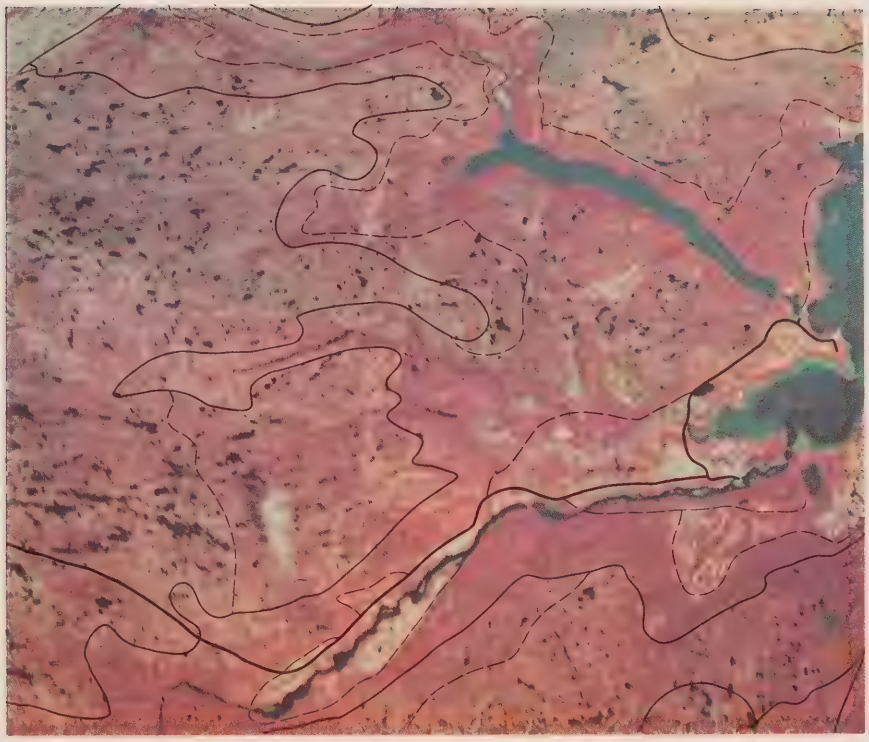


Figure 10: A satellite colour composite image of the Goose Bay map sheet (National Topographic Series — 13F) superimposed with boundaries of land regions and land districts taken from the 1:1,000,000 map.

photographs were then examined.

Reconnaissance flights were flown over Labrador in Department of National Defence Argus aircraft at altitudes ranging from 300 to 1000 m above the ground (figure 8). The flight paths were planned to cross as many land unit boundaries as possible, to verify the preliminary delineations and to obtain more detailed descriptions of the terrain.

Contentious boundaries on the imagery were reviewed, giving consideration to the reconnaissance observations. This stage also involved reference to various single discipline maps and published reports although the satellite image was the end reference onto which the final boundaries of Land Regions and Districts were directly drawn. The delineations were then transferred onto a stable base map at a scale of 1:1,000,000. The detailed District descriptions were derived mainly from existing references and reconnaissance missions.

THE LAND REGIONS AND LAND DISTRICTS

The descriptions of the Regions outline the general characteristics of climate, physiography and vegetation as well as the resource implications of these attributes. The Regions are identified on the map accompanying this report by a name, an uppercase letter, and colour code. Photographs are included when appropriate to give a visual introduction to some of the typical features of each Region.

The Land District focuses on separation of the Land Region into major physiographic or geological patterns based on relief, structure and geomorphic evolution. On the accompanying map districts are delineated and numbered within each Region. The features of each are detailed by symbols on the map and in an appendix. The characteristics described are topography, genetic materials, surface expression, vegetation: density and physiognomy, and the percentage of open fresh water bodies. Land capability ratings for various land uses are included in Appendix A.

Land Region A: Cape Chidley (1190 sq. km: .5% of Labrador). Mountains and valleys constitute this northernmost Region of Labrador. It is subjected to severe climatic conditions and receives Labrador's lowest total annual precipitation (400 mm), mainly in the form of snow. Ice floes persist into the summer months along the coast. The vegetation is restricted to a sparse cover of tundra and sedges. Polar bears seasonally frequent this Region's shores.

LAND REGION A-CAPE CHIDLEY

(1190 Sq. Km.)

(I) LOCATION AND CLIMATE

This Region encompasses the most northern lands of Labrador. Bounded by the Quebec border in the west and the Labrador Sea to the east, it extends north from the Eclipse River to Cape Chidley.

The prevailing climate is harsh with short cool summers and long arctic winters. Mean annual temperature (MAT) is -5°C. An average annual precipitation of 500 mm is the lowest of all the Regions within Labrador (Peach, 1975). Snowfall is estimated to average 200 cm annually. In general, coastal ice persists for longer periods than elsewhere along the Labrador coast. During "bad" years, ice break-up at some coastal sites may not occur until August. Ice floes are common (Anonymous, 1967).

Inland, permafrost is continuous in valleys and mountains.

(II) PHYSIOGRAPHY

Four Districts partition this Region. These Districts describe distinct physiographies which include: rounded mountains split by submerged glacial troughs (fjords) (A-1), steep-sided mountains with cirque and arête topography (A-2 and A-3), and relatively level terrain protruding into the Labrador Sea (A-4). The latter District contains strand lines that are remnants of beaches from former sea levels.

Glacial history of this Region is uncertain. The highest peaks are described as nunataks by Loken (1962), while Ives (1975) gives evidence of total ice cover at the height of the Wisconsin glaciation.

Hummocky bedrock forms dominate this Region's highest ground. From there, steep slopes covered with talus and associated fans extend to the valley floors.

Morainal deposits interspersed with alluvial and glaciofluvial material form a mantle on the larger valley floors. Frost polygons reportedly occur (Abbe, 1936).

Geology is dated to Aphebian or earlier age and consists of granitic gneiss, granulite and paragneiss (Greene, 1974). This Region occurs wholly within the Churchill Structural Province.

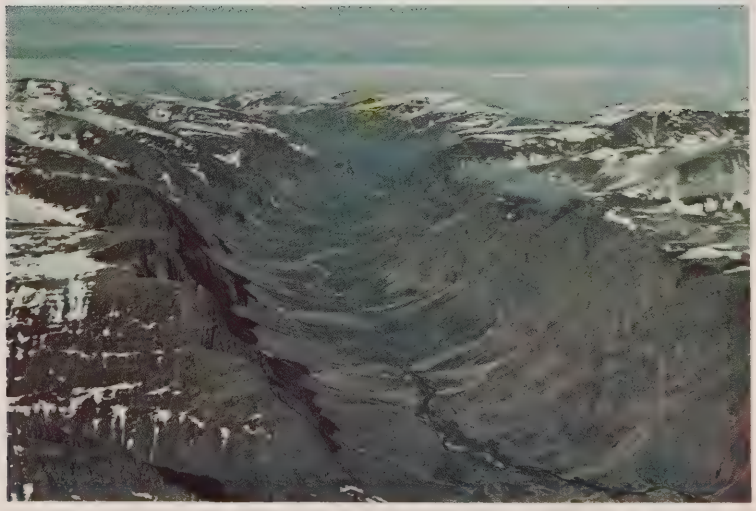
(III) VEGETATION

The harsh climate, poor soil development and predominance of exposed rock results in a very sparse vegetation cover in this part of the Tundra Region (Rowe, 1572). Lichen and mosses are the dominant physiogomic forms. Sedges and ericaceous shrubs such as crowberry and alpine bearberry occur sporadically. The Region's short growing season (less than 1000 degree-days above 5.6°C), the seasonal flooding, and cold air inversion combine to restrict the distribution of these plants on valley floors. Hence, vegetation is located principally on southfacing valley slopes and in protected ravines.

(IV) RESOURCE IMPLICATIONS

Mineral exploration in this Region has given no indication of significant deposits. Sparse vegetative cover restricts wildlife distribution to small mammals such as arctic hare (*Leprus arcticus*), lemming (*Discrostonyx hudsonius*) and arctic fox (*Alopex agopus*). The land/water interface provides a seasonal habitat for polar bears, *(Ursus maritimus)* which prey upon the migratory seal *(Phoca* spp*)* populations. Fish such as arctic char *(Salvelinus slpinus)* and sea-run trout *(Salvelinus fontinalis)* may occur in some of the rivers. These wildlife resources are utilized by Eskimos originating from as far away as Port Burwell, N.W.T. (Coombs, 1970).

The Region's recreational potential relates to its attractions as a scenic wilderness area. Also, features of Quaternary glaciation are ideal examples for educational pursuits.



Land Region B: Seven Islands (1820 sq. km: .5% of Labrador). The deep U-shaped valleys and fjords of Region B penetrate and partition the Torngat mountains of Region C. Local conditions within the deep valleys (up to 1000 m. deep) tend to temper the harsh climate of this northern latitude. Thus, unlike the sparsely vegetated Torngat Region, shrub, lichen and sedge species occur in Region B. The south-facing slopes of the valleys support a relatively dense vegetative growth (right of centre in the photograph).

LAND REGION B-SEVEN ISLANDS

(1820 Sq. Km.)

(I) LOCATION AND CLIMATE

The Torngat Mountains are split by the deep glacial troughs of Region B. These ice-scoured U-shaped valleys and fjords have a distinct east-west orientation. The Eclipse River valley in the north and the valley which empties into Ramah Bay in the south are the boundaries of this Region. The average annual precipitation of the Seven Islands Land Region is estimated at 500-700 mm with an average of 300 cm as snowfall. The MAT is estimated at -5° C (Peach, 1975). These statistics do not adequately reflect the variability in climate between the lower elevations of Region B and the peaks of Region C. Vegetation in part, reflects this difference and is discussed below. Also, undoubtedly the east/west orientation of Region B yields distinct climates for south and north-facing slopes. The south-facing slopes receive a high incidence of solar radiation and hence are warmer and drier while the north-facing slopes receiving much less insolation, have cooler and moister sites. Region B, is in the continuous and widespread permafrost zones.

Coastal ice conditions vary from year to year. "Bad" ice years have resulted in floes persisting into late July (Anonymous, 1971).

(II) PHYSIOGRAPHY

The four Districts of this Region contain evidence of continental glaciation. The eastermost tongues of the most recent ice sheets flowed through this Region and calved in the Atlantic Ocean. As the glaciers receded into what is now Quebec, the valleys served as spillways (Ives, 1957).

Up to three phases of deglaciation have been recognized in this part of Labrador (Loken 1962). The latter two phases are marked by trim lines on upper valley slopes. Lateral and end moraines and glaciofluvial landforms occur in the valleys as evidence of this glacial history. Braided streams and deltas occupy the valley floors. Bedrock cliffs with colluvial aprons divide this Region from the Torngat Land Region.

Coastal marine deposits are now overlain by thin organic soils. Previous marine levels are marked by strand lines which are reported to occur as high as 49 m above sea level (a.s.l.) (Loken, 1959).

Two geological Provinces, Churchill and Nain occur in Region B (Greene, 1974). Most of the Region's bedrock is Helekian granitic gneiss with some Archean granitic gneiss occurring in the Nain Province.

(III) VEGETATION

As part of the Tundra Region (Rowe, 1972), Seven Islands Region has a short growing season (less than 1000 degree-days above 5.6°C. Lower slopes are dominated by a cover of shrub, sedge, moss and lichen growth. Willows, dwarf birch and Labrador tea occur along with a myriad of hardy arctic forms of vegetation.

South-facing slopes usually have a denser and more extensive growth of plants than those with a northern exposure. On valley floors, seasonal flooding prevents large areas from being vegetated. Excessively drained soils and harsh climate also limit vegetative distribution.

(IV) RESOURCE IMPLICATIONS

Occurrences of copper, chert, asbestos, galena, pyrite, pyrrotite, graphite, and allanite have all been documented but are not economically exploitable (Douglas, 1976).

Caribou *(Rangifer tarandus)* migrate into this Region in summer months. Polar bears follow harp, (*Phoca groenlandica*) and ringed seal *(Phoca hispida)* migrations along the coast. A year-round population of arctic animals such as hares, ptarmigan *(Lagopus* spp) and fox occur. Anadramous fish occur in streams and rivers while trout have been caught in deeper lakes. During September and October, medium concentrations of seabirds occur off shore (Brown, *et al* 1975).

A wilderness recreation experience is readily attainable but prevailing harsh weather conditions would restrict use and access.

LAND REGION C - TORNGAT

(6090 sq. km.)

(I) LOCATION AND CLIMATE

The Quebec border to the west, the Eclipse River valley to the north, the Labrador Sea to the east and Saglek Fjord to the south encompass much of this mountainous Region. The Kiglapait and Kaumajet mountains, two southern outliers, comprise the remainder of this Region's area.

An average annual precipitation of 700 mm of which 500 cm falls as snow, and a MAT of -5°C characterize the climate (Peach, 1975). Elevations range from sea level to over 1500 meters and local climate patterns vary accordingly. The climate extremes due to the variation in elevation are tempered near the coast by the cold Labrador Sea during the summer months.

Sea ice usually persists until the end of June, but in some years when melt days are infrequent and on shore winds dominate, ice may persist into mid-July (Anonymous, 1968).

Inland lakes remain frozen well into July and snow may remain in isolated pockets year round. The Torngat Region is within the zones of continuous and widespread permafrost. The latter occurs in areas near the coast.

(II) PHYSIOGRAPHY

The Torngat mountains are the uplifted end of a Mesozoic peneplain (Ives, 1957a). This uplifting occurred in the Tertiary period and was most extensive within this Region. Subsequently, the area was eroded before the last ice advance and later subjected to glacial erosion which accounts for the spectacular rugged terrain. Three periods of Pleistocene glaciation are recognized in northern Labrador (Greene, 1974).

The Kiglapait and Kaumajet mountains were completely covered by ice during the two earliest glaciations. The most recent, or Saglek glaciation, was not as extensive and the Torngat, Kaumajet and Kiglapait mountains projected as nunataks. The Saglek glaciation left trim lines at 275 m a.s.l. in the northern valleys which dissect this Region and at 700 m near the Kiglapait mountains. The middle period of glaciation left trim lines at 450 m a.s.l., in the north and at 760 m a.s.l in the southern and western Torngats (Loken, 1962).

The various glacial advances and retreats left a series of distinct landforms; the high peaks have expanses of rock detritus and lower slopes have both lateral and end moraines and minor occurrences of glaciofluvial kames and terraces. The side slopes of the mountains are exposed bedrock mostly in cliff form. Colluvial fans have developed at the base of these cliffs. Alpine glaciation resulted in the numerous cirques common to the Region, most of which are occupied by tarns.

The Churchill and Nain Structural Provinces encompass the Torngat Region. The Churchill Province is mainly granulite, mylonitized gneiss and granitic gneiss bedrock. Sedimentary rock overlies the Nain Province gneisses. The volcanic Kaumajets are of the Neohelikian sub-era while the Kiglapait mountains are an intrusive Paleohikian anorthosite. (Greene, 1974).

(III) VEGETATION

Exposure is but one of the factors which hinder plant distribution in this part of the Tundra Region (Rowe, 1972). Poor soil development, type of substrate, cold temperatures (less than 1000 growing degree days annually) and dessicating winds all contribute to this Region's characteristic sparse cover of lichens and mosses. Arctic representatives of the sedges, grasses and forbs are also common (Abbe, 1936). Shrubs, comprising mostly willows and ericaceous species, are scarce in the mountainous terrain. The lower sheltered slopes harbour patches of dense vegetation in which shrubs such as alders and willows are more abundant. Organic terrain occurs infrequently.

(IV) RESOURCE IMPLICATIONS

The ruggedness of this Region impedes travel, yet, caribou are known to traverse the mountains in the summer months. Other species also migrate seasonally from more hospitable valleys into this Region. Shorelines along the Labrador Sea are steep and provide little wildlife habitat. The few beaches and other gradually sloping shoreland may be frequented seasonally by polar bears.

The few lakes of appreciable size are not very productive and the indigenous trout species is susceptible to overfishing (Coombs, 1970).

Mineral occurences generally are not economically attractive. Magnetite, copper, molybdenite and beryl have been documented for the Nain Structural Province. In addition, a deposit of an estimated 2-3 million tons of pyrite (averaging 38% sulfur and 34% iron) occurs at

Rowsell Harbour (Greene, 1974). Active mining of this deposit was attempted in 1934 and abandoned in 1936 (Douglas, 1976).

Churchill Province in the Torngat Region contains minerals such as graphite and allanite. Intensive explorations have yet to be carried out in most of the area.

The Torngat Region has a high recreation potential. The rugged pristine terrain, and an innate beauty all add to the wilderness experience this area has to offer, and may give just cause for designation as a National Park.

Land Region C: Torngat (6090 sq. km: 2% of Labrador). The highest mountains east of the Rockies occur in this Region (up to 1459 m. asl.). The uppermost peaks of the Torngat Mountains were not covered during the advance of the last continental glaciation. Expanses of frost shattered rock (felsenmeer) and alpine glaciation features are characteristic. The severity of the northern climate is augmented in this elevated Region thus vegetation is limited to a sparse lichen growth.

Land Region D: Western Plateau (10,300 sq. km: 3.5% of Labrador). Land Region H: Fraser River (9,130 sq. km: 3% of Labrador). These two Regions have a common border near the Fraser River: Region D (plateau in photograph) extends north and west into Quebec whereas Region H includes valleys and coastal lowlands as far south as Hopedale. The Western Plateau (Region D) has a corrugated topography. A vegetative cover of lichens and sedges provides food for caribou herds during the annual migration. In Region H, extensive spruce-fir stands occupy the valley floors while up slope, shrub forms of willows and birches grow.

LAND REGION D-WESTERN PLATEAU

(10300 sq. km.)

(I) LOCATION AND CLIMATE

Three geographically separate areas all bordering Quebec constitute this Region in Labrador. The northern area borders on the Torngat Region (C), the m id area borders on the Domes Region (F), and the southern area borders on the Range Region (G). Valleys which are part of Regons B, F, and H penetrate Land Region D.

In the north, the Torngats and to the south, less elevated mountains, buffer this Region from the tempering influence of the Labrador Sea. As a result, a continental climate persists with a MAT slightly colder than - 5°C, and an annual precipitation of 700 mm of which 300 cm falls as snow, (Peach, 1975).

Lakes remain frozen as late as July when an ice free period of less than 150 days begins. There are less than 1000 growing degree-days. Land Districts D-1 through D-4, occur in the continuous permafrost zone while D-5 and D-6 occur in the widespread subzone.

(II) PHYSIOGRAPHY

Corrugated topography with a north-south alignment in District D-1 through D-5 and an east-west alignment in District D-6 is characteristic. This topography is a direct result of glaciation and bedrock control. Morainic and glaciofluvial landforms are found throughout in the southern Districts. The northernmost district (D-1), once under glacial meltwater, contains remnants of this inundation.

The mid-part of Region D (i.e. D-2, D-3) is dominated by exposed bedrock and scattered rock interspersed with till. Bedrock geology is within the Churchill Structural Province and is composed of granitic gneiss and granulite with some mylonitized gneiss.

(III) VEGETATION

The harsh continental climate in this part of the Tundra Region (Rowe, 1972) allows only for the growth of a sparse cover of arctic tundra species. Unvegetated areas of exposed rock, and disturbed soil are framed principally by lichens. Among the lichens, prostrate forms of ericaceous shrubs are mixed with willows, moss and sedge species. Region D is Labrador's southern extension of non-forested terrain.

(IV) RESOURCE IMPLICATIONS

Large lakes comprise up to 30% of some of the Districts' areas. They are unproductive and easily overfished. As many as 60,000 caribou graze this Region as summer range.

Mineral exploration has not been extensive and has not resulted in any economic finds. Ground moraines, alluvium and eskers are rated to contain a moderate ground water potential (Shawinigan Eng. Co., 1968).

The Region's subdued relief in combination with unspectacular monotonous vegetation cover offers a minimal attraction for recreational pursuits.

Region E: Saglek (6320 sq. km: 2% of Labrador). Region F: Domes (4320 sq. km: 1.5% of Labrador). The U-shaped valleys and fjords of Region E penetrate the rounded mountains of Region F, from Saglek Bay to Okak Bay. The harsh climate of the uplands is tempered within the valleys. Along the coast the climate is moderated by the marine influence. Region E contains the most northern coastal occurrence of tree growth: willows are common and a few coniferous stands grow near the southern regional boundary. The vegetation cover in the uplands of Region F consists of shrubs, lichens and sedges.

LAND REGION E-SAGLEK

(6,320 sq. km.)

(I) LOCATION AND CLIMATE

Land Region E, a coastal Region composed of seven Districts, extends from Nakvak Brook south to the settlement of Nain. In the north it dissects and is enclosed by parts of the Torngat Region (C) and the Domes Region (F). Further south, Region E is bordered by Region H (on the west) and the Labrador Sea (on the east).

Generally, the regional climate is summarized by a MAT of -5°C, an average annual precipitation of 600-700 mm. with an average annual snowfall of 300 cm. (Peach 1975). The close proximity of the Labrador Sea has a moderating effect on the climate. Permafrost is widespread along the coast and continuous inland.

(II) PHYSIOGRAPHY

The Saglek Land Region is composed of U-shaped valleys, coastal inlets and fjords. As in Region B (Seven Islands) rejuvenated streams had incised the present location of the valleys prior to glaciation. The valleys were then glacially scoured and subsequently served as meltwater channels. They presently contain moderate sized streams which drain the surrounding higher ground of the adjoining Land Region. As a result, reworked glaciofluvial material and recent alluvium mantle the valley floors. Colluvial aprons have formed at the base of very steep valley slopes.

In the south, the valleys are wider and more rounded. Organic terrain is sparse however, being more abundant near the southern border. Palsa bogs are common.

Bedrock geology is of the Structural Provinces; Churchill and Nain. The former Province consists of granulite and mylonitized gneiss. The Nain Province is composed of highgrade metamorphic rocks predominanely quartzofeldspathic gneisses (Greene, 1974). The Nain bedrock is of the Archean age while the Churchill bedrock is dated predominantly Aphebian and earlier.

(III) VEGETATION

Labrador's northern limit of coniferous trees (white and black spruce) occurs along the shores of Napaktok Bay. Willows, alders and dwarf birch are abundant throughout the valley slopes and uplands. Valley floors are innundated seasonally by rapidly flowing streams thus limiting vegetative colonization. In this Region of east-west aligned valleys, the southerly exposed slopes have a higher incidence of more favorable sites for plant growth.

Saglek Region is divided between Rowe's (1972) Boreal Forest Region (Section B-32, Forest Tundra; transition zone forest to tundra) and the Tundra Region.

(IV) RESOURCE IMPLICATIONS

The spectacular scenery, the coastal milieu and relative ease of accessibility represent a moderate to high attraction value. The presence of the northern tree limit is a notable feature. Nain may serve as a base for access to this Region. Caribou are frequent in early July, shortly after vegetation begins peak growth. An overlap of arctic and boreal species habitats exists in this part of Labrador.

Some of the valleys contain extensive sand and gravel deposits. These valleys have potential as aggregate sources. They also exhibit moderate to high ground water potential (Shawinigan Eng. Co., 1968). Forest value is marginal beyond that of a source of firewood for local residents of Nain. The poor growing conditions in this area of Labrador could result in a rapid depletion of this resource if overexploited.

Region E: Saglek (6320 sq. km: 2% of Labrador). Region F: Domes (4320 sq. km: 1.5% of Labrador). The U-shaped valleys and fjords of Region E penetrate the rounded mountains of Region F, from Saglek Bay to Okak Bay. The harsh climate of the uplands is tempered within the valleys. Along the coast the climate is moderated by the marine influence. Region E contains the most northern coastal occurrence of tree growth: willows are common and a few coniferous stands grow near the southern regional boundary. The vegetation cover in the uplands of Region F consists of shrubs, lichens and sedges.

LAND REGION F-THE DOMES

(4,320 sq. km.)

(I) LOCATION AND CLIMATE

The upland Domes Land Region is situated south of the Torngat Mountains, east of the Western Plateau Region (D) and north of the rounded hills of Land Region G (Central Ranges). Land Region E (Saglek) dissects most of this Region and buffers it from the Labrador Sea.

Continental climate prevails although maritime climate occurs where this Region borders the cold Labrador Sea. Climate data presented by Peach (1975) include a MAT of -5°C and an annual precipitation of between 600-700 mm of which 200-300 cm falls as snow. The mean annual length of the growing season ranges between 80 and 100 days (anonymous, 1957). The widespread permafrost subzone includes the coastal areas of the Domes Land Region while the continuous permafrost zone is prevalent inland.

(II) PHYSIOGRAPHY

Three phases of Pleistocene glaciation (Greene, 1974) covered this Region. A few cirques occur in the higher peaks. Landforms are dominantly exposed rock and ice shattered detritus. Colluvium also occurs along with minor deposits of glaciofluvial and recent alluvial material. Organic terrain is sporadically distributed. Permafrost-associated features and processes such as solifluction striping and polygonal forms are apparent.

The Domes Region is divided between the Churchill and Nain Structural Provinces. The former contains Aphebian-aged metamorphic rocks which are mainly gneisses while the latter is Archean-aged basement gneisses (Greene, 1974).

(III) VEGETATION

The upper slopes are very sparsely vegetated by lichens, mosses and arctic forbs and herbs. Very poor growing conditions exist in most areas. Ericaceous shrubs, willows and alders have gained a foothold on some lower slopes.

Rowe (1972) includes this Region in his Tundra class.

(IV) RESOURCE IMPLICATIONS

Economic mineral finds have not been documented for this area of Labrador. The Region is in the path of the summer migration of caribou. The terrain is not suitable as winter habitat.

The barren hills separated by deep valleys are a spectacular sight. This attraction is somewhat diminished by the even more attractive vistas found to the north in the Torngat Region. The now abandoned Saglek air base may serve as a gateway to the area.

Region G: Central Range (10,520 sq. km: 3.5% of Labrador). Inland, from Okak Bay to south of Notakwanon River, Region G, a mountainous area (background of photograph) is interrupted by numerous fault valleys of Region H (in foreground). The mountains are sparsely vegetated: shrubs, lichens, sedges and mosses occur at high elevations; shrub forms of spruce and balsam fir occur at low elevations.

LAND REGION G-CENTRAL RANGES

(10,520 sq. km.)

(I) LOCATION AND CLIMATE

Land Region G, an area of rounded mountains, is geographically separated by Region H (Fraser River). It is bordered on the west by Land Region D (Western Plateau), on the north by Land Region F (Domes), on the east by Land Regions E (Saglek) and H (Fraser River) and in the south by Land Region L (Postville).

A continental climate characterized by a MAT of -5°C, and an average precipitation of 700 mm annually with just over 300 cm of this falling as snow occurs (Peach, 1975). Growing degree-days approximate 1000. Permafrost is scattered in the south, widespread in the middle and continuous in the north west corner.

(II) PHYSIOGRAPHY

The scarp-like border on the east and along the valleys of Region H accounts for Region G's mountainous appearance. topography is rugged in comparison with the more subdued terrain of adjoining western areas. The rounded mountains have been glaciated. Bedrock, frost-shattered colluvium and erratics are the dominant land-forms. In contrast, thick till deposits occur in the southern part.

Most of Region G is included in the Churchill Structural Province. Bedrock formations are Helikian anothosites. gabbros, and associated acidic intrusives (Greene, 1974).

(III) VEGETATION

Vegetation cover is minimal with lichens predominating. Shrub growth on slopes consists of matted spruce, ericaceous shrubs, and eastern larch along with erect forms of willows, alders and dwarf birch. Arctic species grow on the majority of sites in this area. Region G is divided among the Boreal Forest Region (section B, 32) and the Tundra Region (Rowe, 1972).

(IV) RESOURCE IMPLICATIONS

The Central Ranges Region is a forbidding barrier to inland travel from the coast. The cliffs that border Region H are a formidable obstruction to easy access. These cliffs provide the adjoining coast with an attractive backdrop landscape for wilderness-type recreational pursuits. The Region is relatively unproductive in terms of wildlife. Lakes amount to as much as 30% of the area of some of the Land Districts (Appendix A). The characteristic low productivity of lakes in northern climates makes them susceptible to overfishing. The proximity of settlements may have already resulted in depletion of this resource. Caribou utilize those areas having heavy lichen growth. Mineral exploration has been minimal and to date no economical occurrences have been identified. The adjacent Regions which are more accessible have many documented mineral occurrences.

Land Region D: Western Plateau (10,300 sq. km: 3.5% of Labrador). Land Region H: Fraser River (9,130 sq. km: 3% of Labrador). These two Regions have a common border near the Fraser River: Region D (plateau in photograph) extends north and west into Quebec whereas Region H includes valleys and coastal lowlands as far south as Hopedale. The Western Plateau (Region D) has a corrugated topography. A vegetative cover of lichens and sedges provides food for caribou herds during the annual migration. In Region H, extensive spruce-fir stands occupy the valley floors while up slope, shrub forms of willows and birches grow.

LAND REGION H-FRASER RIVER

(9130 sq. km.)

(I) LOCATION AND CLIMATE

Land Region H, extends from Okak Bay south to Ugjoktok Bay. It is abutted by coastal Regions E and I on the east and Land Region G on the west as far as Ugjoktok Bay. This Region is low-lying and is sheltered from the harsh climate common to the surrounding barren uplands of Region G. Although the -5° C MAT isotherm dissects this and adjoining Regions (Peach, 1975), yearly and daily temperature ranges are probably greater in the Fraser River Region. The presence of an extensive forest cover indicates that climate is not as limiting a factor as in northern and surrounnding Regions. Precipitation is estimated to average between 600-700 mm per year. Permafrost is widespread throughout the north and scattered in the south.

(II) PHYSIOGRAPHY

The Fraser River Region has three distinct physiographies; the narrow low-lying land which parallels the coastline; the valleys which extend into Region G and the rolling bedrock-controlled hills in the south.

The valleys are a direct result of glacial scouring as in the more northern valleys of Regions E, B, and A. Glaciofluvial deposits on valley floors have been reworked by recent streams. Colluvial aprons edge the valley floors which also consist of morainic material. Talus cones occur among the precipitous upper bedrock slopes. Strand lines have been noted in the upper reaches of Okak Bay (Andrews, 1961). Coastal lands in this Region also contain marine deposits. Both Nain and Churchill Structural Provinces are represented; the Churchill is principally granulite rock, while the Nain Province consists of anorthosite with some adamellite and related rocks. All the bedrock is of the Helikian age (Greene, 1974).

(III) VEGETATION

The northern limit of Labrador's continuous forest cover encompasses the Fraser River Land Region. The deep sheltered valleys support relatively large black and white spruce trees. Gnarled eastern larch grow on the slopes along with stunted forms of balsam fir and spruce. Within this northern extension of the Boreal Forest, other characteristic Boreal species of shrubs, mosses and sedges also grow. Above the tree line, dwarf birches, willows and ericaceous shrubs occur. Land Districts H4 and H5 differ from the more northern Districts in that climate is more hospitable to vegetation growth.

Rowe (1972) enclosed this Land Region in his Boreal Forest Region, section B-32.

(IV) RESOURCE IMPLICATIONS

The standing forest cover has marginal economic value. The conifer forests provide cover and habitat for boreal species such as black bear *(Ursus americanus)* and other smaller mammals. Fishing may hold some developmental possibilities. A variety of mineral occurrences are recorded but to date their exploitation has not been deemed viable. In contrast to surrounding Regions, this particular area of Labrador has been intensively explored because of the relatively easy access from the coast and the presence of settlements.

Region 1: Hopedale (6200 sq. km: 2% of Labrador). This coastal Region with numerous inlets and islands extends from south of Nain to Indian Harbour. Exposed bedrock strewn with boulders characterizes this Region's landscape. Dwarf coniferous trees, shrubs, sedges and mosses grow on protected sites.

LAND REGION I - HOPEDALE

(6200 sq. km.)

(I) LOCATION AND CLIMATE

This coastal Region, composed of three Districts, extends northwards from Groswater Bay to Nain. It includes barren offshore islands and those coastal lands that are most directly affected by coastal climatic conditions. Among the islands and within bays and inlets, ice persists until mid-June and reforms by mid-November. Offshore ice floes can be seen until the end of June. Makkovik, Hopedale and Davis Inlet are the major communities. The prevailing climate, although tempered by the proximity of the Labrador Sea, is harsh. Annual average precipitation varies from a low of 600 mm in the north to 800 mm near Makkovik. Temperature means range between -2.5°C and 0°C. Most of this Region is within the limits of the scattered permafrost zone.

(II) PHYSIOGRAPHY

This coastal section comprises a barren peneplained plateau and associated offshore islands. The plateau is characterized by an irregular coastline that is incised by fjords extending well inland. Upland, surficial deposits are minimal except for local colluvium. Valleys may contain tills, outwash and marine depositions of varying thickness. Scattered organic terrain occurs and sizeable bogs exist south of Davis Inlet.

Beaches are rare along the mainland coast, however, many of the islands have shallow beaches associated with their inlets.

Metamorphic rock formations dominate. This Region is included within the Nain geological Province of the Canadian Shield. Although various intrusions do occur, gneisses tend to be the most prevalent bedrock.

(III) VEGETATION

Mosses and lichens colonizing bedrock form the most dominant plant communities. Treed vegetation is minimal. (except in sheltered hollows and valleys). Scrub spruce and birch occur randomly on the plateau. Patches of spruce and balsam fir, with scattered white birch. alders and willows grow on valley tills and outwash deposits. Spruce-lichen forests depict the better-drained river terraces. Many of the poorly-drained marine clays and silts are typified by bog development. The Hopedale Land Region is in the transition section (B-32) of the Boreal Forest Region (Rowe, 1972).

(IV) RESOURCE IMPLICATIONS

Parts of the Nain Province have been surveyed intensively for mineral occurrences. The Makkovik-Aillik area in particular, holds promise of mining potential for both uranium and molybdenum. On-going exploration may define other areas along this coastline that have possibilities for extractive operations. A labradorite quarry on Tabor Island was operated in the early 1900's (Greene, 1974).

This Region falls directly in the path of the Atlantic coast Flyway for migratory birds which utilize many of the sheltered bays as resting or staging areas. As well, various shore birds breed and nest along the coastline. The more abundant species include Razorbill *(Alca torda)*, murres (Uria spp.) and Puffin (*Fratercula arctica*). A number of islands in District I-1 have sizeable colonies of these birds at various times of the year, (Brown *et al.*, 1975).

Region J: Mistastin Lake (14,400 sq. km: 5% of Labrador). The western boundary of Labrador bisects Region J which extends from the headwaters of the Kogaluk River to Knob Lake Junction. The rolling topography is vegetated by abundant lichens and a sparse coniferous tree cover. This woodland represents the northern inland limit of the tree line within Labrador. Labrador's largest caribou herd utilizes this Region.

LAND REGION J-MISTASTIN LAKE

(14,400 sq. km).

(I) LOCATION AND CLIMATE

Mistastin Lake Region consists of 11 Districts and extends from Knob Lake in the west, east to Willow Lake and from there north past Mistastin Lake. An outlier to the south (District J-11) is also part of this Region. The climate is generally continental with an average annual precipitation of 700 mm of which 300 cm falls as snow. (Peach, 1975). The -5°C MAT isotherm crosses the Region. The widespread permafrost subzone is prevalent except for District J-11 which is within the scattered permafrost subzone.

(II) PHYSIOGRAPHY

Broad river valleys, former lake beds and rolling hills composed of exposed rock, till and glaciofluvial material characterize this Region. The final remnants of inland glacial ice in northeastern Labrador were in the Knob Lake area (Ives, 1966). In the northeast around Mistastin Lake, expanses of exposed rock, morainic veneer and glaciofluvial deposits occur. The origin of Mistastin Lake is debated because of its unusual outline. It may be derived from a meteor (Taylor, 1969) or volcanic activity (Currie 1968). Eskers have an east-west alignment in the Mistastin Lake area in contrast to the north/south arrangement in the vicinity of Knob Lake. Organic terrain is more prevalent in this Region than in areas further north. Sedimentary and volcanic rocks occur in the Labrador Trough near Knob Lake. Further east, intrusive anorthosites of Helikian age occur in combination with Aphebian and earlier metamorphic rocks. The latter are composed mainly of granitic gneiss and granulites. The bedrock around Mistastin Lake is anorthosite.

(III) VEGETATION

The northern continental tree limit in the western part of the Labrador-Ungava peninsula traverses the Mistastin Lake Land Region. Stunted "candelabrum" shaped black spruce scattered among expanses of lichens are particularily characteristic. Along water courses and on lower slopes better tree growth occurs. The thick lichen carpets common to this Region are mixed with scattered ericaceous shrubs, mosses and sedges. The latter species are concentrated on organic terrain. Some of the excessively drained sites have an uninterrupted cover of lichens. Two sections (B-32 and B-13A) of the Boreal Forest Region, (Rowe, 1972), divide this Ecological Land Region.

(IV) RESOURCE IMPLICATIONS

The Knob Lake iron ore deposits are well known. Other viable concentrations of various base metals may occur within the Labrador Trough. The extensive lichen-covered terrain supports a very large caribou herd. The caribou, a high incidence of open water and the northern tree limit all combine to give the Region a relatively high recreational potential.

Region K: Harp Lake (8560 sq. km: 3% of Labrador). The Harp Lake Region is composed of four geographically separate upland areas. These uplands are incised by deep valleys with the Harp Lake Valley being the most prominent. The large upland areas of exposed bedrock are interspersed with a sparse cover of lichens and dwarfed trees and shrubs growing in scattered hollows.

LAND REGION K -HARP LAKE

(8560 sq. km).

(I) LOCATION AND CLIMATE

Land Region K is made up of four geographically separated areas but three Land Districts. The largest of these areas, centered on Harp Lake, comprises one Land District. Two narrow upland areas to the east are a second Land District. Another area which lies east of Hope and Disappointment Lakes, constitutes a third Land District. This region is not differentiated from surrounding terrain in the synoptic climate maps produced by Peach (1975). A MAT between -5°C and -2°C and a mean annual precipitation between 700-800 mm is estimated. The tundra-like vegetation, in contrast to the boreal vegetation of neighbouring Regions, is indicative of a harsher climate than the climatic generalizations suggest. The boundary between the widespread and scattered permafrost zones bisects this Region.

(II) PHYSIOGRAPHY

The Harp Lake Land Region is an upland area dominated by exposed bedrock. A few deeply incised valleys, in particular the Harp Lake Valley, are characteristic. Colluvial fans, talus slopes, scattered rock debris and a few glaciofluvial deposits on the lower ground cover much of the landscape.

Bedrock geology is divided among the Churchill and Grenville Provinces. The Churchill Province bedrock is Paleohelikian anorthosite, while the Grenville rock is composed of gabbro and some sillimanite gneiss, both of Helikian age.

(III) VEGETATION

Both Rowe, (1972), and Wilton (1964), classify most of this Region as arctic tundra. Typically, dwarfed spruce and larch mixed with ericaceous shrubs grow in the scattered swales. Elsewhere, lichens and mosses surround extensive areas of bare rock. The sheltered lower slopes support boreal forest stands of black and white spruce. Some of these sites are included by Wilton, (1964), in his "Submarginal Forest Zone".

(IV) RESOURCE IMPLICATIONS

The upland barrens are generally poor wildlife habitat. The protected lower slopes with tree cover provide habitat for a few boreal wildlife species. The deep lakes contain trout but are relatively unproductive and could not sustain intensive angling. Incised valleys, such as the one containing Harp Lake, have aesthetic appeal.

Mineral occurrences have not proven to be economically viable in any of the Districts of this Region. Transportation routes would be extremely costly and difficult to build because of the lack of borrow materials.

Region L: Postville (18,140 sq. km: 6% of Labrador). This Region of sand and gravel plains, deltas and rugged hills extends west from Postville to include the Kanairiktok River. Generally, only slow growing spruce and balsam fir forests occur in Region L. Relatively better growing stands do occur along streams and lower slopes in the hilly districts. The excessively drained sand plains support a dense lichen growth.

LAND REGION L-POSTVILLE

(18,140 sq. km.)

(I) LOCATION AND CLIMATE

Land Region L consists of nine Land Districts that encompass broad river valleys, organic terrain and rugged hills. The Kanairiktok River in the west, Harp River in the north and Big River in the east are the largest rivers draining this Region. The Naskaupi River headwaters are also contained by Region L. Postville, near the mouth of the Kaipokok River, is the largest settlement.

The MAT for this Region is -2.5°C. Average temperatures along the coast are slightly higher than inland because of the moderating effect of the Labrador Sea. An average of 800 mm of precipitation falls annually; snowfall accumulations reach between 300-400 cm. annually. (Peach, 1974). Coastal fog is common. The growing season averages between 100 and 120 days while the ice-free period for lakes ranges from 150 days inland to 180 days near the coast.

With the exception of the northeastern part of this Region which is in the widespread permafrost subzone the scattered permafrost subzone is prevalent.

(II) PHYSIOGRAPHY

Two very distinct physiographies occur in Region L; low-lying areas which are mostly centred on water courses and appalachian-type, rugged uplands. Within the lowlands glaciofluvial material dominate in delta, outwash and kame terrace forms. Dunes have accumulated on the shore of Snegamook Lake and along the Kaipokok River. Fine textured marine intrusions are now marked by organic terrain. Extensive boulder fields also occur.

The upland area is composed of parallel ridges of sedimentary rock. The tops are exposed, while side slopes grade from a thin till veneer at the top to deeper tills on the lower slopes. Colluvium is interspersed with the till.

Bedrock geology of the Region is divided into the Churchill and Nain Provinces. The Churchill Province is composed of Helikian sedimentary and volcanic rocks. The Nain Province contains both Helikian and Aphebian aged rocks (sedimentary and acidic intrusives respectively) and associated metamorphic rocks.

(III) VEGETATION

Vegetation is as diversified as the physiography. The large expanses of glaciofluvial material, dunes and till veneer are excessively drained, thus permitting only a spruce-lichen association to grow. Best forest growth is encountered along river courses and lower slopes. Wilton (1964) classifies this area as part of his "Good Forest Zone" and Rowe (1972) categorizes it as part of the productive Hamilton and Eagle Valley Section (B-12) of the Boreal Forest Region.

White spruce attains a large diameter and height along the river valleys. Balsam fir is a major component, as is black spruce. White birch is also present. Trembling aspen reaches its northern limit in this Region. Large tracts of organic terrain are limited to sites of marine deposits with an impeded drainage, particularly in Land District L-2.

(IV) RESOURCE IMPLICATIONS

The restricted areas of good forest growth are good sources of pulp if accessibility, markets and other economic constraints can be overcome. Meanwhile a portable sawmill should well serve any local needs. More wood products may be needed to supply the requirements of uranium mining by Brinex Corporation.

Uramium deposits have been mapped in Region L near the headwaters of Kaipokok River in District L-6 (Greene, 1974). Base metal deposits of copper, chalcopyrite, lead, and zinc also have been identified.

The proliferation of lichens, is suitable for caribou habitat. Presently the potential carrying capacity for caribou in this area is not matched by the standing herd. A potential exists for caribou husbandry.

The wide, lengthy rivers provide a moderate recreational attraction. The coastline of the Benedict Mountains has attractive beaches and is given a high recreational rating by Pierce (1974). The hills of Districts L-6 and L-5 are rated above average for recreation.

Region M: Smallwood Reservoir (36,300 sq. km: 13% of Labrador). The Smallwood Reservoir occupies a sizeable proportion of this Region, the largest of Labrador. Lower slopes offer well-drained sites for a relatively good forest growth; the excessively drained sites support a lichen cover with scattered tree growth; poorly drained sites promote bog vegetation. This Region contains good breeding habitats for waterfowl.

LAND REGION M-SMALLWOOD RESERVOIR

(36,300 sq. km.)

(I) LOCATION AND CLIMATE

The Smallwood Reservoir Land Region, the largest in Labrador, is centered on the Smallwood Reservoir and extends south to include Atikonak Lake. It is surrounded by 8 Regions (P, Q, R, S, K, O, L, J). A private road joining Esker (on the Quebec North Shore and Labrador Railway) and Churchill Falls (in Region S) traverses this Region.

Climate is continental. The reservoir and other large bodies of open water moderate the climate locally. The MAT is between -5° C and -2.5° C. Average annual precipitation is 800 mm of which 300 cm occurs as snow. (Peach, 1975). Most of this Region occurs in the scattered permafrost subzone. Mean annual growing season ranges between 100 and 120 days.

(II) PHYSIOGRAPHY

This Region is characterized by esker and drumlin ridges. In the northeast corner the alignment of drumlins and eskers is east-west while in the southwest alignment is north-south. Bedrock outcrops are not common in this Region of deep till and glaciofluvial deposits. Drumlinized till is dominant to the east while glaciofluvial material dominates in the west. Organic terrain, string bogs and fens, are prominent in the south and central portions. The creation of Smallwood Reservoir inundated numerous small lakes and expanses of organic terrain.

Bedrock is of the Churchill and Grenville Structural Provinces. The Churchill Province rocks are sedimentary, metamorphic and intrusive. The Grenville rocks are mainly quartzofeldspathic gneisses (Greene, 1974).

(III) VEGETATION

This part of Labrador is classified as subarctic forest (Rowe, 1972). This section (B13a), of the Boreal Forest Region, is between the productive forests to the south and the forest-tundra vegetation to the north. It is dominated by open lichen-woodlands with black spruce the principal tree species. Bogs are numerous. On well-drained sites closed canopy forest stands of black spruce mixed with balsam fir and white spruce occur.

(IV) RESOURCE IMPLICATIONS

Region M is part of an area rated to have the greatest population of waterfowl in Labrador. An average density of three ducks per square mile is estimated (Gillespie, 1973). The effects of Smallwood Reservoir on this wildlife resource are not documented.

The railroad and the private road network used in the construction of the various reservoir dams makes this Region potentially one of the more accessible in Labrador. Presently the railroad is utilized to transport iron ore mined at Schefferville to Sept Isle, Quebec. Iron ore deposits occur the length of the Labrador trough and base metals have also been documented, but development of these is not planned at this time (Greene, 1974). Recreation and forestry possibilities are rated as poor.

Region N: Benedict Mountains (3340 sq. km: 1.0 % of Labrador). This Region of uplands and rounded mountains includes four geographically separated areas north of Groswater Bay. Local climate influenced by elevation and exposure hinders vegetative growth. However, in sheltered areas, a sparse cover of dwarf birch, spruce and balsam fir occurs in conjunction with a continuous carpet of sedges and mosses.

LAND REGION N: BENEDICT MOUNTAINS

(3340 sq. km.)

(I) LOCATION AND CLIMATE

This Region is situated south of Makkovik and west of Holton Harbour. Most of Region N has a common boundary with Region L (Postville). It also borders on Regions I (Hopedale) and O (Nipishish Lake).

The climate summaries for this area are the same as for the adjacent and more hospitable terrain. Generalizations include a MAT of between -2.5°C and 0°C and an average annual precipitation between 700 and 800 mm (Peach, 1975). The mean annual length of the growing season is estimated at between 100 and 120 days. Yet, this Region has no tree cover in comparison to the flourishing forests of Region L with which it shares these statistics. Measurements specific to Region N would undoubtedly indicate a harsher climate than the above data relate. Permafrost is widespread in this Region although according to Brown (in press) this area exhibits only scattered occurrences of permafrost.

(II) PHYSIOGRAPHY

The rounded mountains of Benedict Mountains Region rise abruptly from the Labrador Sea. The land side is characterized by a more gradual slope. Cirque-like forms containing glaciofluvial deposits occur on the higher peaks. Otherwise, the dominant landforms are veneer tills and colluvium and bedrock outcrops.

The geology of Land Region N is of the Nain Structural Province. The bedrock is composed of acidic intrusives and associated metamorphic rocks.

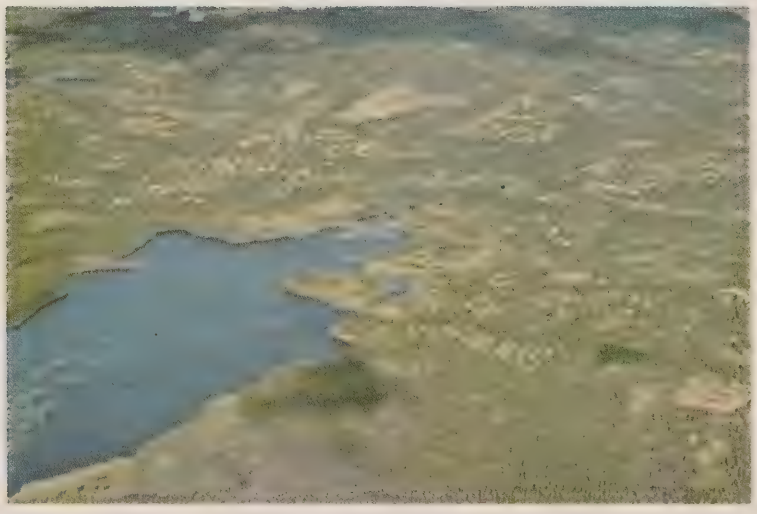
(III) VEGETATION

The lack of tree cover in this Region is striking. Willows are the dominant shrub but, speckled alder and ericaceous shrubs are also present. Sphagnum and sedges are the two dominant forms of ground cover; the former on ground where water movement is hindered and the latter on slopes with good drainage. Dry sites are covered with lichens and arctic alpine species. Forest Sections B-13a and B-32 of The Boreal Forest Region (Rowe, 1972) partition The Benedict Mountains Land Region.

(IV) RESOURCE IMPLICATIONS

The Benedict Mountains offer some of the most spectacular scenery south of the Kiglapait Mountains (Pierce, 1974). (appendix A).

Presently, mining interest is mimimal. Steep slopes, thin soils and widespread permafrost are a constraint to engineering activities.



Region O: Nipishish Lake (18,900 sq. km: 6.5% of Labrador). This plateau Region is located both north and west of Lake Melville (Region T). The lower lying areas of this glaciated plateau are occupied by bogs bordered by stunted spruce. Lichens with scattered tree growth also typify the Region. Bedrock outcrops are common.

LAND REGION O — NIPISHISH LAKE

(18,900 sq. km.)

(I) LOCATION AND CLIMATE

The Naskaupi-Red Wine River and Churchill River valleys divide Region O into four geographically separate areas. This Region rings the lower-lying Region T (Lake Melville).

Climate is characterized by an average annual precipitation of between 800 and 1000 mm. Average annual snowfall amounts to between 400 and 500 cm. The MAT is estimated to be 2.5°C (Peach, 1975), and the average length of the growing season is between 100 and 120 growing degree days. Permafrost is scattered. The annual ice free period on most lakes averages between 150 to 180 days.

(II) PHYSIOGRAPHY

Nipishish Lake Land Region is a rolling plateau area dominated by varied depths of till, mostly in the form of drumlins. Kames and eskers occupy many of the valleys. Bedrock outcrops are frequent. The eastern part of the region is characterized by volcanic sills. Organic terrain is widespread.

Geology is classified as part of the Grenville Structural Province. Adamellite, anorthosite and paragneiss make up much of the bedrock.

(III) VEGETATION

The Boreal Forest Region (B - 13A) (Rowe, 1972) encompasses this Land Region and the forest cover is principally composed of stunted black spruce. On better sites, such as protected side slopes, white spruce and balsam fir dominate open canopy stands. Eastern larch is a common component of forest stands in wet and open areas. Lichen-woodlands occur on glaciofluvial deposits and on thin soils over bedrock. Organic terrain is dominated by fens. Dwarf birch is common throughout.

(IV) RESOURCE IMPLICATIONS

This part of Labrador holds less than moderate potential for recreation (Pierce, 1974). Numerous large lakes and cascading streams provide scenic and angling potential to an otherwise monotonous and isolated area. Forestry has no potential and mining possibilities have not been identified. The predominance of bedrock in the southern part of this Region would be a constraint to major engineering tasks.

Region P: McPhayden River (7670 sq. km: 2.5% of Labrador). Region P, in western Labrador, is an upland of faulted and fractured bedrock of the Canadian Shield. The large expanses of exposed bedrock and otherwise thin soil may be attributed to a high incidence of fire. A stunted and sparse tree cover occurs over a more abundant layer of lichens. Valleys which contain deeper soils support dense forest stands.

LAND REGION P-MCPHAYDEN RIVER

(7,670 sq, km.)

(I) LOCATION AND CLIMATE

The McPhayden River Land Region is situated in the westermost part of Labrador. The scarp, which is parallel and just west of Howell's River and the Menihek Lakes mark this Region's eastern boundary. The drainage divide, which also serves as the interprovincial boundary for Quebec and Labrador, delineates the western edge of Region P in Labrador.

Climate is distinctly continental. A MAT of between -5°C and -2°C and an annual precipatation average between 800-900 mm (of which 400 cm. falls as snow) characterize the Region (Peach, 1975). Mean annual length of the growing season ranges from 120 days in the south to 110 days in the north (anonymous, 1974). Region P is within the scattered and widespread permafrost subzones of Canada.

(II) PHYSIOGRAPHY

Land Region P is coincidental to the Labrador boundaries of the Kaniapiskau Uplands (Bostock, 1970). The area consists principally of rounded, rocky hills with thin and scattered drift. A number of the river valleys were glacial spillways. Lakes are uncommon and often linear in shape following the fracture lines of the underlying bedrock.

Land Region P boundaries coincide with Labrador's Superior Structural Province. Rock formations are granulitic gneisses and acidic intrusives (Greene, 1974).

(III) VEGETATION

Black spruce is the dominant tree species throughout. The entire area is included in the boreal Forest Region (Rowe, 1972) but divided among Sections B-32 and B-13a.

Thin soils, frequency of fires and harsh climate have led to a proliferation of lichen woodlands. Exceptions are the well-drained areas with deep fresh soils occurring on lower slopes and along water ways. These sites support white spruce along with black spruce and balsam fir that grow to a relatively large size.

(IV) RESOURCE IMPLICATIONS

The thin soils common to this Region pose a problem to the construction of transportation routes. Valleys with deeper deposits are relatively uncommon yet may serve as the only avenues open to crossing this Region. Vegetation is not diverse and generally provides poor habitant for wildlife. This Region is rated as having a moderate to poor recreational potential (Pierce, 1974). Mining related activity is presently restricted to reconnaissance surveys.

Region Q: Seahorse (13,800 sq. km: 5% of Labrador). This Region in southwest Labrador extends north and west of Seahorse to north of Labrador City. The deep, well-drained glacial deposits are characterized by black spruce-lichen woodlands (foreground in photograph). White birch groves occur on recently burned sites. Poorly drained terrain is dominated by bogs. Region Q has productive caribou and waterfowl habitats.

LAND REGION Q—SEAHORSE

(13,800 sq. km.)

(I) LOCATION AND CLIMATE

Land Region Q occupies the southwestern corner of Labrador. Labrador City, Wabush and part of the right-of-way of the Quebec North Shore and Labrador Railroad lie within this Region. Drainage is to the north through the large Joseph, Shabogamo and Ashuanipi Lakes.

Climate is continental. Annual precipitation is between 900 and 1000 mm annually. Snowfall averages 400 cm per year and the MAT is slightly colder than -2.5°c. The Region is within the scattered permafrost subzone. Mean dates of complete freeze-up and first thaw of Wabush Lake are Oct. 26 and May 15 respectively. (Peach, 1975).

(II) PHYSIOGRAPHY

Relatively level land interspersed with rolling terrain characterize this Region. The level areas are covered with large expanses of organic terrain while the rolling hills are composed of a mixture of veneer tills, glaciofluvial material and drumlins overlying bedrock. Land District Q-6, forming the southeastern part of Land Region Q, is hummocky with bedrock commonly exposed.

Both fast and slow flowing streams are present in the Region. The subdued terrain contains the slow moving water forming large shallow lakes while the upland areas contain many small lakes and swift streams.

Bedrock in this part of the Grenville Structural Province is paragneiss, granulite and sillimanite gneiss. The bedrock is of the Helikian and earlier age (Greene, 1974). Aphebian aged rock is represented in the Normanville fold belt along the western edge of the Region.

(III) VEGETATION

Land Region Q is contained by the Chibougamau-Natashquan Section (lb) of the Boreal Forest Region (Rowe, 1972). Black spruce is the dominant species. Larch is usually a minor component existing mainly on the margins of forest stands.

Wilton (1964) categorized the forest vegetation as sub-marginal and arctic tundra. Although Rowe's classification considers this area as productive, examples of good-growth stands are rare. Altitude, poor soils and perennial fires have hindered commercial forest development.

(IV) RESOURCE IMPLICATIONS

The economic importance of this Land Region is centered on the presence of the greatest reserves of iron ore in North America. These are mined at Wabush and Labrador City. No other mineral prospects have yet been identified for this Region.

Caribou summer range and calving areas are found in Region Q. Waterfowl habitat is relatively good. Seahorse Region, according to Banfield (1974) contains the only inland moose population in Labrador. The marginal nature of the habitat makes moose population readily susceptible to decimation by hunting.

The area's relatively rich wildlife population combined with an attractive physiography yields a moderate recreational rating.

Engineering aspects of development would be hampered by the large expanses of open water, organic terrain and permafrost features. The relatively abundant glaciofluvial deposits and some of the tills may serve as sources of borrow material.

Region R: Domagaya Lake (9900 sq. km: 3.5% of Labrador). Numerous lakes occupy this undulating upland of southwestern Labrador. Thin soils interspersed with bedrock outcrops, form much of the surficial expression of Region R. Shallow soil conditions and extensive forest fires have hindered regeneration. As a result, lichens are prevalent and the forest cover is stunted and scattered.

LAND REGION R-DOMAGAYA LAKE

(9900 sq. km).

(I) LOCATION AND CLIMATE

The headwaters of the south-flowing Romaine River indent the southern boundary of Labrador and are enveloped by Region R. The Atikonak River headwaters fall within this Region. An outlier of this upland Region is located next to the Churchill River at Mount Rapids.

Domagaya Region has a continental climate characterized by a MAT of -2.5°c, and 900 mm annual precipitation with a 400 cm annual snowfall. Based on data from Lake Eon, Quebec, the mean date for lake freeze-up is October 31st and lakes become ice free on the 21st of June. Scattered permafrost occurs in Region R.

(II) PHYSIOGRAPHY

Massive uplands ascending to elevations of over 1000 m characterize this Region. The highest terrain occurs in Land District R-1 centered on Domagaya Lake. Esker and drumlin fields occur on either side of the uplands.

Bedrock outcrops with veneer tills dominate. District R-2 contains lower elevations than other areas of the Region and has a large proportion of deeper tills and organic terrain. Glaciofluvial material, principally in the form of eskers, is also present.

The Region is enclosed by the Grenville Structural Province. Bedrock is of the Helikian age or earlier and is either anorthosite, gabbro or a metamorphic rock.

(III) VEGETATION

The Domagaya Land Region is classified by Wilton (1964) as scrub and submarginal forest zone and is divided between the Chibougamou-Natashquan, B-1b) and the Northeastern transition sections (B-13a) of Rowe's (1972) Boreal Forest Region.

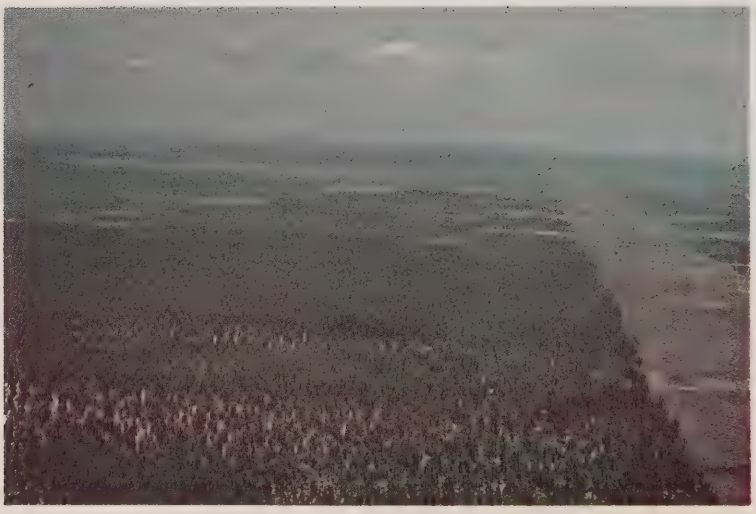
Shallow soils coupled with an extensive fire history have reduced the forest cover to open and poor form stands. A black spruce-lichen association is the most prevalent vegetation cover. The lower slopes and low-lying areas are occupied by closed black spruce stands. Balsam fir and white spruce are few while tamarack is limited to the periphery of water bodies on rivers. Burnt areas may be recolonized by white birch but black spruce and lichens dominate this successional role. Sphagnum black spruce forest associations are also common.

(IV) RESOURCE IMPLICATIONS

Although the uplands rate highly for recreational pursuits, other components of the landscape tend to downgrade recreational potential. (Pierce, 1974). Caribou utilize Land Districts R-1 and R-2 as part of their summer range.

Poor forest growth minimizes forest industry potential. Opportunity for mining magnetite and illminite is minimal since the ore bodies are not concentrated.

The upland bedrock massif will prove to be a hindrance to construction. The abundance of eskers and other glaciofluvial material on the periphery will provide a good source of aggregate. Organic terrain is not extensive and is easily avoided.



Region S: Churchill Falls (23,490 sq. km: 8% of Labrador). This forested Region of plains and wide valleys forms a broad arc from the Kenamu River to Churchill Falls. Black spruce dominates the forests of the plains; white spruce may occur on the moist sites bordering streams and on lower slopes. Lichens are established on the rock outcrops. Bogs also occur in this region wherever drainage is impeded.

LAND REGION S—CHURCHILL FALLS

(23,490 sq, km.)

(I) LOCATION AND CLIMATE

Churchill Falls Land Ragion extends east from the settlement of Churchill Falls to the headwaters of the Kenamu River and south to the Labrador/Quebec boundary. Six Land Regions (R,M,O,T,V,X) border Land Region S.

The climate is characterized by warm summers and cold winters. The maximum and minimum temperatures recorded at Churchill Falls are 30.6°C and -43.9°C respectively (Peach, 1975). The annual temperature averages just below -2.5°C. Precipitation averages 900 mm near Churchill Falls and 1100 mm at the Labrador/Quebec border. Snowfall between 400 and 500 cm is expected annually. Scattered permafrost occurs in the Region. Lakes are ice free for 150 to 180 days per average year and the mean annual length of the growing season is 120 days.

(II) PHYSIOGRAPHY

Broad river valleys, rolling topography and a preponderance of drumlinized till are characteristic of this Region. Valleys are dominated by glaciofluval material, recent alluvium and organic terrain. Upper slopes are covered with a veneer of till. Bedrock outcrops are most common near and at the top of the numerous hills. Impeded drainage has resulted in the development of organic terrain.

The bedrock in this part of the Grenville Province is principally paragneiss and granitic gneiss. The exact age of these Precambrian rocks is uncertain (Greene 1974).

(III) VEGETATION

The Boreal Forest Region, (Section B-13a), encompasses the Churchill Falls Land Region (Rowe, 1972). Lichen-black spruce woodlands are typical. Stream courses and the shores of lakes are lined by eastern larch whereas mesic sites are covered with closed canopy stands of white spruce and balsam fir in combination with the ubiquitous black spruce. Hilltops are commonly without tree cover. Numerous large burned areas attest to the frequency and intensity of fires.

(IV) RESOURCE IMPLICATIONS

Some of the proposed future hydro-electric developments in Labrador involve a number of the rivers which have their headwaters in this Region. All are interprovincial rivers and are also included in Quebec hydro-electric development plans. The Romaine River in particular is under scrutiny by both governments. The Natashquan River has been investigated by Parks Canada for suitability as a recreational river.

Wilton (1964) included the Churchill Falls Region as part of Labrador's "Fair and Marginal Forest Zone." Concentrated mineral deposits have not been found. The relatively thick deposits of till and glaciofluvial material will facilitate the engineering facets of development.

Region T: Lake Melville (16,850 sq. km: 6% of Labrador). The most productive forests in Labrador occur within this Region which borders Lake Melville. Hummocky terrain consisting of deep glacial deposits is common. Bogs have developed extensively on the poorly drained coastal plain. The deep river valley soils support mixtures of deciduous and coniferous trees. Lichen woodlands dominate the dry sites. Elsewhere, balsam fir and spruce are prevalent.

LAND REGION T-LAKE MELVILLE

(16,850 sq. km).

(I) LOCATION AND CLIMATE

The Lake Melville Region encompasses the coastal plain of Hamilton Inlet (including lands adjacent to Lake Melville and Grand Lake) and extends inland along the Kenamu, Naskaupi and Churchill Rivers. Its westerly limit stretches beyond Winokapau Lake along the Churchill River valley. To the south, it abuts the steep northern slopes of the Mealy Montains. The northern limits reach the rolling plateau country north of Lake Melville. Situated within the Region are the towns of Goose Bay and Happy Valley. Temperatures are modified for much of the Region by Lake Melville. The mean annual temperature is 0°C and recording stations at Goose Bay indicate an average frost-free period of less than 80 days. Goose Bay in an average year is completely free of ice into late November. Ice break-up begins in May and often extends into late June in some of the local bays. Precipitation averages between 900 mm and 1000 mm annually. Permafrost is scattered.

(II) PHYSIOGRAPHY

This Region has 13 Land District encompassing terrain that includes coastal marine clays, river valley outwash terraces and kames and tills overlying bedrock. Much of the undulating upland topography is characterized by shallow till and colluvium. Rock outcrops are common. The coastal plain surrounding Hamilton Inlet consists of deep, poorly-drained clays. Remnant parallel beach ridges are common. Coarse-textured, well-drained terraces and kames that flank the larger river valleys are undergoing active slumping. The largest terraced deposits occur around Goose Bay at the mouth of the Churchill River.

The existence of beach lines as high as 400-450 m above present sea level indicates the magnitude of relative sea level change since post-glacial times. The drumlin and lake alignment within the Region is generally east-west.

Bedrock formations largely include paragneisses and granitoid gneisses of probable sedimentary origin. Sandstones, conglomerates and shales form localized outcrops (Greene, 1974).

(III) VEGETATION

Vegetation communities range from bogs developed on marine clays to well-developed stands of balsam fir with white spruce, white birch and trembling aspen on well-drained alluvium. The Region lies within the Hamilton and Eagle Valley Section of the Boreal Forest (Rowe, 1972). Black spruce and balsam fir are prevalent on shallow upland soils. Within the coastal plain, spruce and balsam fir growth is restricted to beach ridges and natural levees of existing streams. Bogs are dominated by Sphagnum mosses.

Fire plays an important role in the maintenance of stand composition and the dominance of black spruce on most terraces and upland hills can be attributed to recurring forest fires. Similarly, prevalence of white birch and trembling aspen in many areas is a result of regeneration after burns.

Fens are rare in this Region. Bazjak (1973) recognized only the "Myrica fens" that occupy silty inter-tidal shores of Lake Melville.

(IV) RESOURCE IMPLICATIONS

This Region includes some of the best timber lands of Labrador (Wilton, 1964). Spruce fir stands on the alluvial bottomlands and terraces surrounding Goose Bay are the most productive. If large-scale economic forestry operations can eventually be mounted in Labrador, this Region would serve as a major source of wood.

Caribou and moose utilize parts of this Region for winter range. However, winter ranges or migration routes, considered critical for species survival have not been documented. Recreation potential exists for angling and canoeing. Hiking potential and aesthetic quality must be considered low when comparisons are made with the adjacent Mealy Mountain Region.

No significant mineral occurrences are documented. Marine clays, easily disturbed sands and slumping river terraces, represent potential engineering problems.

Region U: Mealy Mountains (2680 sq. km: 1% of Labrador). The Mealy Mountains are typified by rock outcrops and alpine vegetation. This Region comprises areas of rounded mountains and fractured bedrock plateaus with shallow soils and numerous lakes. The few U-shaped valleys which dissect the highlands contain local sand and gravel and till deposits. Sheltered areas support stands of widely spaced balsam fir and black spruce. Shallow fens also occur.

LAND REGION U—MEALY MOUNTAINS

(2,600 sq. km.)

(I) LOCATION AND CLIMATE

This Region is restricted to the main body of the Mealy Mountain ranges south of Lake Melville and an extension situated north of Dove Brook on the west shore of Sandwich Bay. The three Land Districts which constitute this Region include the most rugged topography found in Labrador south of the Torngat Mountains.

The mean annual temperature (MAT) is -2.5°C and most of the higher peaks are snow-covered year round. Annual precipitation approximates 1100 mm. Lakes remain ice-free for 180 days or less. Permafrost is scattered.

(II) PHYSIOGRAPHY

The Mealy ranges, with peaks reaching 1200 m(a.s.l.) are some of the highest mountains in Labrador. Exposed bedrock is prevalent. This bedrock mainly anorthosite criss-crossed by gabbro dykes and sills, is marked on the north and east sides by abrupt scraps. The northern scarp is the southern border of the Lake Melville graben. Existing erratics are granodiorites and granitic gneisses. Interesting geomorphological features include glacial striae, roche moutonées and perched blocks.

Surficial material is minmal but talus slopes are common. Frost action has produced a scattered colluvial veneer throughout the rolling plateau section. Local morainal and kame depositions are present in some of the valleys. The numerous lakes of the plateau are aligned predominantly east-northeast following the fault lines. Drainage is primarily via many small streams that cascade down the steep slopes. Subsurface drainage is minimal.

(III) VEGETATION

Tree cover is sparse. Much of the rolling terrain above treeline is covered by a myriad of lichen, alpine bearberry, and other alpine flowers. A few scrub birch are encountered. Sheltered slopes and vales have stunted black spruce and balsam fir with Labrador tea. Fens are characteristically shallow (less than .5m deep over bedrock), and dominated by various sedges and some bog laurel. Rowe (1972), considers the Mealy Mountain Region part of the Tundra Region.

(IV) RESOURCE IMPLICATIONS

This Region, some 75 km. due east of Goose Bay, has high aesthetic value. Hikers along the edge of the scarp are afforded a spectacular view of Lake Melville and the surrounding lands. The cascading streams found along the steep slopes are an added attraction. On the barren uplands, alpine flowers and lichens provide scenic colours from the late spring through fall.

Although caribou herds have been known to utilize parts of this Region as summer range, it is not considered as a critical habitat area for ungulates. Its best potential lies in the utilization of the inherent aesthetic and vegetative qualities for recreational and educational pursuits.

Region V: Eagle Plateau (19,090 sq. km: 7% of Labrador). Bogs are interspersed with a stunted open forest, lichen woodland and exposed bedrock on the plateau which comprises Region V. Various glacial meltwater deposits (esker complex in foreground) occur and are conspicuous among the expanses of bogs. Labrador's highest snowfall occurs in this Region. A high raptor and waterfowl population utilizes Eagle Plateau.

LAND REGION V-EAGLE PLATEAU

(14,945 sq. km).

(I) LOCATION AND CLIMATE

This Region consisting of 11 Districts, encompasses the plateau and associated lowlands south of the Mealy Mountains. It extends southwest from the upper reaches of the English and North Rivers to the Kenamu River valley. The upper reaches of the Paradise and Eagle Rivers also fall within this Region.

Annual precipitation averages between 1100 mm and 1200mm. This Region receives the greatest average annual snowfall within Labrador (over 500 cm). Annual temperatures average less than -2.5°C; consequently, most lakes and bogs are frozen by early December and spring breakup often extends well into June. Scattered permafrost occurs.

(II) PHYSIOGRAPHY

The topography varies from vast tracts of level and boggy terrain along the southern boundary to a bedrock-controlled plateau that adjoins the Mealy Mountains. A few conspicuous eskers traverse the organic plain. Shallow tills, colluvium and occasional pockets of glaciofluvial materials typify much of the rolling plateau area.

Lakes are particularly common within the southern districts. Surface drainage in the plateau is via shallow, fast-flowing rivers and streams. Tributaries of the large Eagle River drain much of the bog lands. The regional bedrock includes metamorphic, anorthosite and acidic intrusives of Helikian age from the Grenville Province.

(III) VEGETATION

The poor drainage characteristics of the underlying surficial materials have led to widespread bog development in the southern part of this Region. Both string and blanket bogs are common. These bogs are surrounded by black spruce and larch of poor form. The few well-drained areas are occupied by balsam fir and white spruce. Region V is part of the Boreal Forest Region (Rowe, 1972).

The upland areas tend to be excessively drained and are prone to fire. Stands of white birch occupy the burn areas. Gradually, stand composition regenerates to a spruce-lichen forest as birch gives way to the more shade-tolerant spruce. An exception to the predominant spruce-lichen forest is the proliferation of alder in the wetter sites along drainage ways.

Organic terrain rarely extends into the uplands. Such "blanket" bogs in many places are only a few centimeters thick over bedrock. Local fen communities exist near some of the lakes and streams.

(IV) RESOURCE IMPLICATIONS

Waterfowl and raptor capabilities within this Region are relatively high. Many of the lakes have excellent sport fishing potential and caribou graze parts of this Region as summer range.

Forest industry potential is limited because merchantable timber occurs only sporadically on the flood plains of some of the larger rivers.

Mineral potential is minimal. The organic terrain with its complex drainage patterns will pose engineering problems, although the eskers which traverse the area represent good sources of aggregates.

Region W: Porcupine Strand (1390 sq. km: .5% of Labrador). Bogs, (right foreground and centre of photograph) surrounded by forest on well-drained sites, typify this Region bordering Groswater Bay. The many excessively drained sites support open stands of black spruce with a lichen ground cover. These sites contain soil materials that were either deposited by glacial meltwaters or are remnants of former beaches. Bog development is predominant on poorly drained marine sediments. This Region's coastline, unlike adjacent Regions, becomes ice free as early as April.

LAND REGION W—PORCUPINE STRAND

(1,397Sq. Km.)

(I) LOCATION AND CLIMATE

This coastal Region, consisting of four Districts, extends north from Sandwich Bay to Groswater Bay. It includes the near shorelands of Trunmore Bay and Porcupine Strand. The coastal community of Cartwright is situated at the southern extremity of the Region.

Weather data recorded at Cartwright indicate a mean annual temperature of 0°C. Precipitation averages between 900 mm and 1000 mm annually, more than half of which falls as snow. Summers are frequently foggy and cool because of the proximity of the sea. Ice break-up may occur in Groswater Bay in early April; however, along the exposed Porcupine Strand, the sea ice may last into June. Scattered permafrost occurs.

(II) PHYSIOGRAPHY

Large tracts of glacial sands and gravels dominate this Region. Along the coastline, the bluffs are composed of marine clays, commonly capped by coarse-textured sands. Inland, hummocky terrain mainly consists of poorly-drained sands which blends into a large plain of deep, well-drained sands. This sand plain, broken sporadically by eskers and wind-eroded beach ridges, extends westward to the Paradise River Region. The few rivers generally are incised in narrow valleys. Local pondings and organic terrain are common in the poorly drained sands adjoining the coastline. Palsa mounds have developed in some of the bogs. Bedrock geology is of the Grenville Province with Helikian anorthosite, granite gneiss and paragneiss being the dominant rocks.

(III) VEGETATION

The sand flats inland from Porcupine Strand are distinguished by a myriad of mosses and lichens in association with widely-spaced spruce. Many of the spruce have a distinctive growth form with the branches tending to spread parallel with the ground before shooting upright thus giving an overall "candelabrum" appearance. Shrub populations are dominated by blueberries, crowberries, and dwarf birch.

Within the poorly drained sands and clays along the coast, the numerous bogs are interspersed in many places by open water. Labrador tea, bog laurel and bakeapple are common associates with the continuous sphagnum moss carpet. Fens are characterized by a sedge-dominated vegetation cover. Dense thickets of black spruce and eastern larch occur locally whereas alders form thickets along some of the protected coastlines. The transitional section (B-32) of Rowe's (1972) Boreal Forest Region includes most of Region W.

(IV) RESOURCE IMPLICATIONS

Poor forest growth characterizes this Region. The widely spaced spruce and larch that occupy the sand plain have no harvest potential. This open growth forest with its moss and lichen ground cover, however, has high aesthetic value and is well suited to extensive recreational pursuit such as hiking. The range of woodland caribou includes this Region.

Mining potential is considered limited although part of this Region may serve as a good source of borrow material. Blowouts in the sand plain can be easily initiated by inappropriate land use.

Several species of seabirds utilize Groswater Bay as an important habitat for varying parts of the year: northern fulmar (*Fulmarus glacialis*), cormorant (*Phalacrocorax* sp.), Atlantic Puffin, glaucous gull, (*Larus hyperboreus*), kittewake (*Rissa tridactyla*), common mure (*Uria aalge*), dovekies (*Plautus alle*). Approximately 75% of the total North American population of the Razorbills is located off the coast of this Region (Brown *et. al,* 1975.)

Region X: St. Paul (12,250 sq. km: 4% of Labrador). The southern boundary of Labrador bisects this Region of rolling topography. Thin soils characterize the many knolls (centre of photograph). Substantial spruce and fir forests grow on the deeper materials that occur on lower slopes and valley floors. Areas of recent burns are often revegetated with blueberry shrubs, lichen and white birch.

LAND REGION X-ST. PAUL

(12,250 sq. km).

(I) LOCATION AND CLIMATE

This Region spans the Quebec-Labrador boundary and includes four Districts within Labrador. It contains the headwaters of the Alexis River, skirts south of the vast bog terrain of the Eagle Plateau Region and extends west to include the upper-middle reaches of the Little Mecatina River.

This Region is well buffered from the moderating effects of the Atlantic Ocean, thus a continental climate with a mean annual temperature of -2.5°C is typical. Average annual precipitation is approximately 1200 mm. The mean growing season exceeds 120 days. Lakes are free of ice, an average of 180 days per year. Permafrost is scattered.

(II) PHYSIOGRAPHY

Rolling hills dissected by broad river valleys characterize this Region. Bedrock composition is primarily granitic gneiss of the Grenville Province of the Canadian Shield. The tributaries of the Little Mecatina, St. Augustin and St. Paul rivers drain south to the Gulf of St. Lawrence. The uplands have a general cover of thin tills. Drumlins are evident particularly within District 2. Glaciofluvial kames and terraces occupy many of the valley floors. Organic terrain is common throughout the Region.

(III) VEGETATION

Forest types with a closed-crown layer predominate. Open lichen-woodland stands are generally confined to sand plains, gravel spreads and other dry sites. Black spruce is the dominant tree species in this Region. Larch grows on the marginal wet sites while white spruce and balsam fir are confined to well-drained alluvium. A considerable mixture of white birch, lichen and blueberries is also present. Bogs are not as common as they are to the north of this Region. St. Paul Region lies within the Newfoundland-Labrador Barrens Section (B-31) of the Boreal Forest Region (Rowe, 1972).

(IV) RESOURCE IMPLICATIONS

Merchantable stands of white and black spruce exist within this Region. If the problems of marketing and transportation are overcome, expansion into this Region could be considered.

No mineral prospects of commercial interest have been documented; however, explorations have not been intensive.

The Little Mecatina River, traversing the western part of this Region, has potential as a wild river. The rapids would challenge a canoeist of moderate skill and the scenery of the valley is varied.

Region Y: Paradise River (19,900 sq. km: 7% of Labrador). The undulating landscape in this photograph typifies Region Y. The hills of these uplands are mantled by glacial depositions of variable thickness. Black spruce, balsam fir and lichen grow on these sites while white spruce occurs principally on lower slopes. Repetitive fires have favoured lichen growth and thus expanded the potential caribou habitat.

LAND REGION Y-PARADISE RIVER

(19,900 sq. km).

(I) LOCATION AND CLIMATE

This Region of eleven Districts consists of broad river valleys and rolling uplands. The Eagle and Paradise Rivers are the largest rivers. Regions Z (Harbour) buffers the Paradise River Region from the Atlantic Ocean and Regions V (Plateau) and X (St. Paul) abut its western edge.

The local climate is influenced only slightly by the Atlantic Ocean. The MAT is between 0° and 2.5°C. Growing degree-days just exceed 120 and the lakes are free of ice for 200 days per average year. Precipitation varies from 1000 mm to 1100 mm and snowfall may accumulate to 500 cm in an average year. Generally, Region Y has more of a continental climate than Region Z (Harbour) and more of a maritime climate than Regions V (Plateau) and X (St. Paul). The zone of discontinuous permafrost includes Region Y.

(II) PHYSIOGRAPHY

The undulating landscape of this Region is bedrock controlled. Upper elevations are mantled by veneer tills while lower slopes consist of deeper tills. The surface expression of the deeper tills varies from level to hummocky. Glaciofluvial depositions are sporadically distributed mainly in the form of terraces and eskers.

Soils occuring over bedrock are usually shallow and poorly drained. This fosters the development of organic terrain and accounts for it's prevalence in parts of Region Y.

Bedrock is of Helikian age and earlier consisting of massive to poorly foliated acidic intrusives and metamorphic rocks, mainly quartzofeldspathic gneisses. Also, Land District Y-7 is underlain by anorthosite, gabbro and associated acidic intrusives. (Greene, 1974).

(III) VEGETATION

Most of this Region is categorized as productive forest land (Wilton, 1964). Rowe (1972) includes most of the Paradise River Land Region in the Hamilton and Eagle Valley Sections (B-12) of the Boreal Forest Region. Unchecked forest fires have dramatically reduced the extent of forest land. Black spruce, in association with lichens, recolonizes these wide expanses of burnt over land. On excessively drained river terraces, this association is seldom replaced. On moist and otherwise fertile sites, balsam fir and white spruce are more prominent.

White birch and trembling aspen occasionally come in as pioneer species on disturbed dry sites. Normally such sites are colonized by blueberry and lichen which then prevail as the ground cover. Both blanket and string bogs dominate the organic terrain.

(IV) RESOURCE IMPLICATIONS

Although forests are productive, lack of access and markets and a fire-depleted stock reduce the immediate economic potential of the forest resource of this Region.

A mica vein was mined at Paradise River at the beginning of the century. This and other mineral deposits have no current economic viability (Greene, 1974).

Most of the numerous rivers draining this Region are rated high for anadromous fish production. Caribou trails crisscross the terraces vegetated with lichen-black spruce associations. Natives claim that caribou were plentiful at one time in this part of Labrador.

Region Z: Harbour (5100 sq. km: 2% of Labrador). Region Z forms a narrow band along the east coast of southern Labrador. The inlets and islands are exposed to the wind, waves and ice. Bedrock outcrops dominate the landscape and distribution of vegetation is sporadic. As is shown in this photograph of Mary's Harbour, protected sites permit growth of shrub forms of spruce and balsam fir and even vegetable gardens.

LAND REGION Z-HARBOUR

(5,100 sq. km).

(I) LOCATION AND CLIMATE

The Harbour Land Region, a coastal strip of land and adjoining islands, extends south from Pack's Harbour through Battle Harbour to East St. Modeste. Four Districts are identified.

The climate is maritime being tempered by the Atlantic Ocean. The MAT of 0°C is high for Labrador and the range of extreme temperatures (23°C) is the lowest for Labrador because of this oceanic influence. Ice floes usually disintegrate by mid-May though ice persistence into late June has been recorded (Anonymous, 1971). Growing degree-days amount to between 100 and 120 days. Precipitation averages 500 mm. and snowfall varies from 300 to 400 cm. Inland areas receive the highest snowfall. Scattered permafrost occurs.

(II) PHYSIOGRAPHY

This Region's coastline is made up of two types. From Pack's Harbour to Table Head the coast is characterized by numerous islands and an irregular coastline. Exposure to waves, wind and ice maintain a barren rock surface. A precipitious and jagged land/water interface is common and sand beaches are sporadically located. South of Table Head the coastline becomes linear, indented only by bays where rivers flow into the Straits of Belle Isle. Inland, bedrock controls most sites and organic terrain occurs in patches in a landscape dominated by veneer tills and colluvium.

Bedrock geology is of the Grenville Province and consists mainly of metamorphic rocks of the Helikian age which are quartzofeldspathic gneisses.

(III) VEGETATION

The light cover of vegetation is stunted and limited to sheltered sites. Exposure and depth of soil are the dominant restricting factors in this vegetative distribution. Black spruce is not tolerant of salt spray and is replaced by white spruce as a dominant species in near-coastal areas. Inland, larch and black spruce prominence increases in an otherwise tundralike landscape.

This Land Region is included in Rowe's (1972) Forest-Tundra Section, (B-32), of the Boreal Forest Region. This classification, a transition zone between forest and tundra, extends from this part of Labrador across northern Canada to the Mackenzie Delta.

(IV) RESOURCE IMPLICATIONS

The Region's many inlets contain fishing settlements. The lengthy ice-free season coupled with navigable bays and proximity to fishing grounds have enticed fishermen to this area of Labrador, once categorized by Cartier as "The Land God Gave to Cain."

The natural resource base is minimal but for fish and the eider duck *(Somateria spectablies)* which breed offshore. Also, the area is on the Atlantic migratory Flyway and avifaunal resting areas occur within the Region.

Region AA: L'Anse-Amour (350 sq. km: less than .5% of Labrador). This Region protrudes only partly into southernmost Labrador. The rolling topography is dissected by river valleys. Heights of land are either exposed rock or covered with a thin layer of soil. The vegetative cover is generally sparse: lichen and shrub associations are prevalent. The deeper, more fertile soils of the valleys tend to support a more dense cover of trees and shrubs than is found on the adjacent uplands.

LAND REGION AA—L'ANSE—AMOUR

(350 sq, km.)

(I) LOCATION AND CLIMATE

L'Anse-Amour Land Region, in southernmost Labrador, borders the Strait of Belle Isle. As a result, the climate is distinctly maritime and relatively mild for Labrador. Precipitation ranges from an annual average of 600 mm at the coast to 800 mm inland. In an average year, snowfall totals 300 cm. MAT is estimated to be above 0°C (Peach, 1974.) The coastal waters generally freeze during mid January with break-up occurring in mid April. This Region is the only one in Labrador without permafrost.

(II) PHYSIOGRAPHY

The Region is coincidental to the eastern extremity of the St. Lawrence Lowlands (Greene, 1974). The topography consists of a series of flat-topped, mesalike hills dissected by streams of various sizes. Soils are thin, both on slopes and on hilltops. These soils are derived from tills and glaciofluvial material. Lower valley slopes and valley floors contain deeper soils of recent alluvial, glaciofluvial and morainal material. Shallow organic terrain occurs on the level hilltops, the crests of which are strewn with loose rock.

Bedrock is Cambrian limestone and sandstone unconformally overlying Grenville gneisses (Greene, 1974).

(III) VEGETATION

L'Anse-Amour Land Region is situated within the Northern Peninsula Section (B-1b) of the Boreal Forest Region (Rowe, 1972). The exposed hilltops are characterized by matted-shrub forms of black spruce (white spruce near the coast), balsam fir, willows, and ericaceous shrubs that occur amongst the lower layer of herb and sedge plants. Spaghum mosses, cotton grass *(Eriophorum* sp.*)* and other wetland species occupy the scattered bogs in the Region. Elsewhere, lichens cling to rock and grow along the periphery of unvegetated terrain.

Sheltered slopes have potential for good tree growth, however, fire and local cutting have contributed to a reduction of standing stock.

(IV) RESOURCE IMPLICATIONS

Historically, the local populace has been employed in offshore and nearshore fishing. Forteau Bay, Pinware Bay and other bays provide natural harbours in an area near cod grounds and salmon runs.

Recreation, forestry, wildlife and mining sectors have little potential in this Region. Should a transportation tunnel be constructed across the Strait of Belle Isle, this Land Region would become the "gateway" to Labrador.

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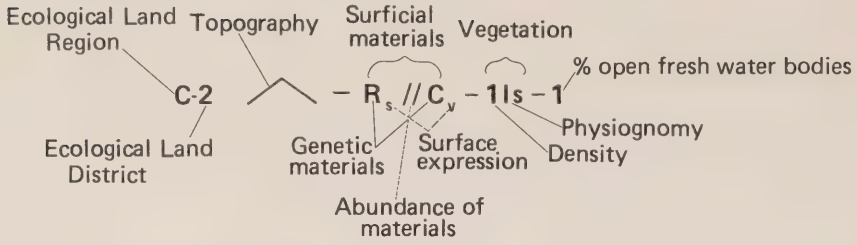
APPENDIX

LEGEND

(appearing on map and of symbols used in Table beginning on page 79).

CONVENTION



TOPOGRAPHY

—steep mountains with cirque/arête topography
—deep U-shaped valleys and fjords
—rounded mountains
—plateau
—rounded valley
—corrugated, fluted
—dissected upland
—V-shaped valley, gorge
—scarp
—incised plateau
—level
—level with eroded channels
—coastal land or land surrounded by water

GENETIC MATERIALS

C Colluvium (mass wastage)
E Aeolian (wind carried)
A Alluvium (stream and river depositions)
L Lacustrine (deposited by fresh standing water)
M Morainal (deposited by glacier)
O Organic (organic matter deposits)
R Bedrock (outcrop and thin covered rock)
W Marine (deposited by saline water)
F Glaciofluvial (deposited by glacial streams and rivers)

The relative amounts of each terrain type are indicated by the use of the symbols =, /, and //.

= - components on either side of this symbol are approximately equal
/ - the component in front of the symbol is more abundant than the one that follows
// - the component in front of the symbol is considerably more abundant than the component that follows

SURFACE EXPRESSION

a	apron	t	terraced
f	fan	v	veneer
h	hummocky	e	eroded
p	level	d	drumlinized
r	ridged	x	complex
s	steep		

VEGETATION:

Density

1. Sparse (mostly bare ground)
2. Light (open ground prominent)
3. Medium (some outcropping)
4. Dense (continuous cover of vegetation)
5. Very dense (more than one continuous layer of cover)

Physiognomy

l	lichen
m	sphagnum (moss)
s	sedges (grasses, forbs)
h	shrubs
t	trees

OPEN FRESH WATER BODIES

1. 0 - 10%
2. 11 - 20%
3. 21 - 30%
4. 31 - 40%
5. 41 - 50%
6. 51 - 60%
7. 61 - 70%
8. 71 - 80%
9. 81 - 90%
10. 91 - 100%

RESOURCE CONSIDERATIONS

(Ratings which are described below appear in table beginning on page 79)

(A) Forestry

The general tree cover distribution for forestry purposes of each Ecological Land Region within Labrador is grouped into one of the following three categories:

N - No tree cover (tundra)

U - Forest stands of poor quality and growth

P - Forest stands of merchantable quality and growth occur

(B) Wildlife

Limited information is available on wildlife populations and habitat within Labrador. The following considerations for relevant Ecological Land Regions have been mainly compiled from personal communication with Newfoundland and Labrador biologists and the Canadian Wildlife Service.

C - Caribou range

Cc - Caribou calving area

S - Major sea bird colonies

E - Eider Duck breeding areas

P - Polar Bear concentrations

R - Raptor Bird concentrations

M - Migratory Bird flyway

S - Seal concentrations

Sa - Salmon Rivers

Mo - Moose concentrations

(C) Recreation

The ratings provided for each Region are taken from **Labrador Tourist and Recreation Overview Study; The Terrain Quality Perspective** by T. W. Pierce. (1974)

The ratings are based on the attractiveness of a number of landscape features such as landforms, natural vegetation and intrinsic views. This classification was developed for the Northern Land Use Information Series published by the Lands Directorate, Canada, Department of Fisheries and Forestry (Beaubier, 1974).

Based on predetermined benchmarks, each landscape feature of a Recreation Region is assigned a numerical value. These are added to give an overall attraction value in each delineated Region. In most instances, these Recreation Regions coincided with the Ecological Land Districts outlined on the 1:1,000,000 map. Where they do not coincide, more than one rating is given. The ratings are as follows:

Class 1 = 70 or more attraction values
2 = 62-69
3 = 54-61
4 = 46-53
5 = 45 or less

(D) Engineering Limitations

Engineering constraints vary widely within each Region but are more consistent within each Land District. For this reason, major engineering considerations are identified by District. The following limitations are noted:

i *Permafrost

W - Widespread permafrost present
S - Scattered permafrost present
C - Continuous permafrost present

ii Topography

M - Mountainous
T - Precipitous Slopes

iii Materials

F - Glaciofluvial material absent or near absent
B - Bedrock at or near the surface
O - Organic terrain present
X - Marine clays present

iv Water

H - Over 30% of land area is open water

* Ratings of permafrost are based on Brown's (in press) permafrost zones.

		FORESTRY	WILDLIFE	RECREATION	ENGINEERING LIMITATIONS
REGION A CAPE CHIDLEY					
A-1	 – $R_h / C_v - 1ls - 1$	N	C,S,P,M,S	3	C–MBF
A-2	 – $R_s // C_v - 1l - 1$			3	C–MT–BF
A-3	 – $R_s / C_v - 1ls - 1$			4	C–MT–BF
A-4	 – $R_h / C_v / W_p - 2ls - 1$			2	W–BXF
REGION B SEVEN ISLANDS					
B-1	 – $M_h / F_t / C_a - 2hlsm - 1$	N	C,P,M,S	4	C
B-2	 – $M_h / F_t / C_a - 2hsl - 2$			4,3,2	C
B-3	 – $C_a / F_t / M_h - 2hlsm - 2$			3,2	C–T
B-4	 – $C_a / M_h / F_t - 2hlsm - 1$			2	W–T
REGION C TORNGAT					
C-1	 – $R_s // C_{vf} - 1l - 1$	N	C	4,3,2	C–MT–BF
C-2	 – $R_s // C_{fa} - 1l - 2$			2	C–MT–F
C-3	 – $R_h / C_v / M_v - 1ls - 1$			4	C–BF
C-4	 – $R_s / C_{vf} - 1l - 1$			2	W–MT–BF
C-5	 – $R_s // C_v - 1l - 1$			3,2	C–MT–BF
C-6	 – $R_s // C_v / M_v - 1ls - 2$			3,2	W–MT–BF
C-7	 – $R_s // C_f - 1l - 1$			3	C–MT–F
C-8	 – $R_s // C_{vf} / F_f - 1ls - 1$			1	W–MT–B
C-9	 – $R_s = C_{vf} - 1l - 1$			2	W–MT–BF
C-10	 – $R_s // C_f / M_v - 1l - 1$			1	S–MT–BF
REGION D WESTERN PLATEAU					
D-1	 – $R_h / M_{dv} - 2ls - 3$	N	Cc	3	C–BF
D-2	 – $M_{dv} // C_v / F_r - 2ls - 2$			5	C–B
D-3	 – $M_{dv} / R_h / C_v - 2ls - 2$			5	C–BF
D-4	 – $M_{dv} / C_v / R_s - 2ls - 3$			5	C–BF
D-5	 – $M_{dv} / C_v // R_h - 2ls - 1$			5	W–BF
D-6	 – $M_{dv} // R_h / C_v - 2ls - 2$			5	W–BF
REGION E SAGLEK					
E-1	 – $F_t // C_a / A_{pf} - 3hslm - 1$	N	C,M,P,S	3	C
E-2	 – $F_t // C_{af} / A_{fp} - 2hslm - 1$			1,2,4	W
E-3	 – $F_t / C_{af} / A_{fp} - 3hslm - 1$			3	W
E-4	 – $R_h // F_t / C_f - 3hslmt - 1$			3	W
E-5	 – $F_{tp} / M_v / C_a - 3hslt - 1$			3,4	W–B
E-6	– $C_v / R_h / M_{hv} - 3hst - 1$			3	W–BF
E-7	– $M_{hv} / C_f / R_h - 2hst - 1$			1,2,3	S–BF

		FORESTRY	WILDLIFE	RECREATION	ENGINEERING LIMITATIONS
REGION F DOMES					
F-1	 – $R_h / C_f - 2 \mid sm - 1$	N	Cc	2,3	C
F-2	 – $M_h // F_t / C_f - 2 \mid hsm - 2$			2,3	C
F-3	 – $R_h // C_f / M_v - 2 \mid sm - 1$			2,3,4	W–BF
F-4	 – $R_h // M_v = C_v - 2 \mid sm - 2$			3,4,5	W–BF
F-5	 – $R_{hs} / M_h / C_v - 2 \mid hsm - 1$			4	W–TBF
F-6	 – $R_s // M_v / C_f - 2 \mid sm - 1$			2,3,5	W–MT–BF
F-7					
REGION G CENTRAL RANGES					
G-1	 – $R_s / C_v - 2 \mid s - 2$	N	C	3,5,2,4	CMT–BF
G-2	 – $R_{sh} / C_v / M_v - 2 \mid hs - 3$			1,2,3,4	C–T–BF
G-3	 – $R_{sh} / C_v = M_v - 2 \mid hst - 1$			3,4,5	C–T–BF
G-4	 – $C_v / R_h / M_v - 2 \mid hts - 1$			3,4,5	W–BF
G-5	 – $C_v / R_h // M_v - 2 \mid hs - 1$			3,4,5	W–BF
G-6	 – $M_v = C_v / R_h - 2 \mid hts - 1$			3,4	W–BF
G-7	 – $R_h / M_v = C_v - 2 \mid hts - 2$			3,4	W–SBF
REGION H FRASER RIVER					
H-1	 – $F_{tp} // C_a / R_h - 3 \mid hs - 1$	U	Sa	1,2,3	W
H-2	 – $F_{tp} / M_v / R_h - 3 \mid hs - 1$			1,2,3	W
H-3	 – $F_{tp} / C_v / R_h - 3 \mid hs - 1$			3,4	W
H-4	 – $F_{tp} / M_v / R_{hs} - 3 \mid hs - 2$			3,4	S–T
H-5	 – $R_s / C_v / F_{tp} - 2 \mid hs - 2$			3,4	S–TB
REGION I HOPEDALE					
I-1	 – $R_h / M_v / C_v - 2 \mid sh - 1$	N	S,E,M	3	W–BF
I-2	 – $R_h // C_v - 2 \mid sh - 1$			4	W–BF
I-3	 – $R_h // C_v / M_v - 2 \mid sh - 1$			5	BF
REGION J MISTASTIN LAKE					
J-1	 – $M_d / L_p - 3 \mid hts - 6$	U	C	3	W
J-2	– $R_h / M_{vd} / F_r - 2 \mid hts - 2$			5	W–B
J-3	 – $F_{pr} / L_p / M_h - 3 \mid ths - 2$			5	W
J-4	 – $F_{pr} / M_v / R_h - 3 \mid ths - 2$			5	W–B
J-5	 – $M_v / R_s / C_v - 2 \mid hts - 1$			4	W–BF
J-6	 – $M_v / R_h // C_v - 3 \mid ths - 2$			5	W–BF
J-7	 – $F_{pt} / M_{vd} - 3 \mid ths - 3$			5	W–B
J-8	 – $M_{vd} / R_h - 3 \mid ths - 2$			4	W–BF
J-9	 – $R_h / M_{vd} // F_t - 3 \mid ths - 2$			5	W–BF
J-10	– $R_h / M_{vd} / F_t - 3 \mid ths - 2$			5	W–BF
J-11	– $R_h / M_v - 2 \mid hts - 1$			3	S–BF

		FORESTRY	WILDLIFE	RECREATION	ENGINEERING LIMITATIONS
REGION K HARP LAKE					
K-1	 – R_{hs}//C_v/M_v–1lhs–1	N	C	4	W–T–BF
K-2	 – R_h/M_v/C_v–1lhs–1			4	W–BF
K-3	 – R_h//M_v/C_v–1lhst–1			4	S–BF
REGION L POSTVILLE					
L-1	– F_p//A_t/E–3lts–2	P	M,Sa	4	W
L-2	 – O//W_{pe}//E–3mlts–1			5	S–OFX
L-3	 – M_v//W_p/O–3htls–1			1	S–BOX
L-4	 – M_v//C_x/R_h–3hlts–2			3	S–BF
L-5	 – M_v/C_v/R_{sh}–3thls–3			3	S–BT
L-6	 – M_{vp}/C_v/R_{sh}–3thls–2			4	S–BT
L-7	 – M_v/C_v/F_h–3mths–4			3	S–BH
L-8	 – O/W_x–3tmls–1			1	S–OX
L-9	– W_x/C_v/R_{hs}–4mts–1			4	S–XBT
L-10					
REGION M SMALLWOOD RESERVOIR					
M-1	– F_{pt}/M_{vd}–3ltm–3	U	C,M	5	W–B
M-2	 – F_x//O–3ltm–2			5	S–O
M-3	 – M_{vd}/F_r/R_h–3thlm–2			4	S–B
M-4	 – O/F_x/M_d–4mhlts–3			5	S–O
M-5	– F_x/O/M_d–3lmhts–7			5	S–OH
M-6	 – O=F_p/A_p–3mlts–3			5	S–O
M-7	 – F_x/M_{dv}/R_h–3ltm–8			5	W–BH
M-8	 – M_d/F_x–3tml–3			4	S
M-9	 – F_x/M_{hv}/O–3ltm–7			5	S–BOH
M-10	 – M_{dp}/O–4tml–2			4	S–OF
M-11	 – F_x/O/M_h–3lmt–2			5	S–O
M-12	– M_d/F_x–3tml–3			4	W
REGION N BENEDICT MOUNTAINS					
N-1	 – C_v/R_h/M_v–2lmst–1	N		1	S–M–BF
N-2	 – R_h/C_x–2lmst–2			1	S–M–F
N-3	 – R_h/C_v/M_v–2lmst–1			4	S–M–BF
REGION O NIPISHISH LAKE					
O-1	 – M_{dp}/O–3mlst–2	U		5	S–OF
O-2	 – M_{vh}/O–3mlst–3			4	S–BOF
O-3	 – M_{dv}/O–3mlst–3			5	S–BOF
O-4	 – M_{vd}/O/R_h–3lmts–2			5	S–BOF
O-5	 – M_v/R_h–3ltms–2			4	S–BF

		FORESTRY	WILDLIFE	RECREATION	ENGINEERING LIMITATIONS
REGION P MCPHAYDEN RIVER					
P-1	 – R_{hs} // C / M_v – 2 l t – 1	U		4	S–T–FB
REGION Q SEAHORSE					
Q-1	 – M_d / F_x // O – 4 t l m – 2	P	C	5	S–O
Q-2	 – M_{dv} / F_p // O – 4 t l m – 5			5	S–B–OH
Q-3	 – M_d / O / F_x – 4 t m l – 4			5	S–OH
Q-4	 – O // M_{dv} – 4 m t l – 4			5	S–F–OH
Q-5	 – O / M_d / F_p – 4 m l t – 8			5	S–OH
Q-6	 – M_{vh} // R_h – 4 t l s – 2			5	S–FB
REGION R DOMAGAYA LAKE					
R-1	 – M_{vd} / R_h / F_p – 3 t l – 1	P		4	S–B
R-2	 – M_{dv} / O – 4 m l t – 3			5	S–FBO
R-3	 – R_h / M_v // C_v – 3 l t – 2			4	S–FB
R-4	 – M_v / R_h // C_v – 2 t l – 2			4	S–FB
REGION S CHURCHILL FALLS					
S-1	 – M_{vp} / O // C_v – 4 t m l – 2	U		4	S–FBO
S-2	 – M_{dv} // O – 4 t m – 2			5	S–FBO
S-3	 – M_{vd} / R_h // O – 4 t l m – 2			5	S–FBO
S-4	– O / F_t // M_v – 4 m l t – 2			5	S–BO
S-5	 – M_{vd} – 5 t h m – 1			4	S–FB
S-6	– M_{dv} / R_h / F_p – 4 t l h – 4			5	S–BH
S-7	 – M_v // F_p – 4 t l – 2			4	S–B
S-8					
REGION T LAKE MELVILLE					
T-1	 – M_{vd} / C_{vf} / A_p – 5 t l m h – 1	P	Mo,M	3	S–FB
T-2	 – A_t // M_{pv} / E – 4 t l h – 1			3	S–FB
T-3	 – M_{dv} // O – 4 t m l – 1			4	S–FBO
T-4	 – O / W_{pe} / A_p – 5 m t h – 1			4	S–FOX
T-5	 – O / W_{pe} – 5 m t h – 2			5	S–FOX
T-6	 – R_h / C_v – 3 t m l h – 1			3	S–FB
T-7	 – M_v / C_v – 4 t m h – 1			4	S–FB
T-8	 – L_{ep} / M_v // F_p – 5 t m h – 1			4	S–B
T-9	 – W_p / O_v / M_v – 5 m t h – 1			4	S–FBOX
T-10	 – M_v / C_v / R_h – 3 m t h – 1			3	S–FB
T-11	 – C_v / R_h / M_v – 4 t l m – 1			3	S–FB
T-12	 – M_{vp} // F_p – 3 m l t – 2			4	S–B
T-13	– C_v / R_h // M_v – 3 l m t – 1			4	S–M–FB

		FORESTRY	WILDLIFE	RECREATION	ENGINEERING LIMITATIONS
REGION U MEALY MOUNTAINS					
U-1	 – R_{hs}/C_v–2lhtm–2	U	C	3	S–T–FB
U-2	 – $R_{sh}//M_v/F_h$–2lhs–1			1	S–MT–B
U-3	 – M_{vh}/R_h–3hlsmt–1			5	S–M–FB
REGION V EAGLE PLATEAU					
V-1	 – $M_v//C_v/R_h$–4tml–1	U	R,Sa	5	S–FB
V-2	– $M_{vh}//F_r/A_p$–3tml–1			5	S–B
V-3	 – $M_v//O/F_t$–3mhlt–1			5	S–BO
V-4	 – M_{vh}/R_h–3ltm–1			3	S–FB
V-5	 – $M_{vp}//R_h$–3tlm–1			5	S–FB
V-6	 – $O//F_r$–4mthl–3			5	S–O
V-7	 – $M_{vp}//F_p$–3tml–1			5	S–B
V-8	– $M_p//F_t/O$–4mlth–2			5	S–O
V-9	 – M_p/O–4mlth–2			5	S–FO
V-10	 – $M_{pv}//F_r/O$–4lmts–1			4	S–BO
V-11	 – $M_{vp}//O$–4mtlh–2			5	S–FBO
REGION W PORCUPINE STRAND					
W-1	– $F_x/O//W_e$–4htlms–2	U	C,S,E,M	4	S–OX
W-2	 – F_{pr}–4lmt–1			4	S–OX
W-3	– $O//F_r/W_e$–4mtl–2			5	S–FBO
W-4	– $M_v//R_h/O$–4mhtl–1			5	
REGION X ST. PAUL					
X-1	– $F_{pt}/M_v/O$–4lthm–1	P		4	S–BO
X-2	 – M_{dv}/O–4thm–1			5	S–FBO
X-3	– $O//M_{vp}$–4mthl–2			4	S–FBO
X-4	M_{vp}/C_x–4thlm–1			5	S–FB
X-5					
REGION Y PARADISE RIVER					
Y-1	 – $M_{vh}//F_t$–4tlm–1	P	Sa	4	S–B
Y-2	– $M_{vh}//F_t/O$–4thm–1			4	S–BO
Y-3	 – $M_{vp}//F_t$–3tlhm–1			3	S–B
Y-4	– $M_{vp}//F_t$–4tlms–1			5	S–B
Y-5	 – $M_{vp}//R_h/O$–4ltms–2			5	S–FBO
Y-6	 – $M_v/R_h//F_t$–3ltm–1			5	S–B
Y-7	 – $M_v/R_h/C_v$–3ltm–1			5	S–FB
Y-8	 – $M_{vh}/C_v//F_p$–4mtl–1			4	S–B
Y-9	 – O/M_{vp}–4mtl–2			5	S–FBO
Y10	 – $M_v/C_v/R_h$–4tml–1			5	S–FB
Y-11	 – $M_{vp}/O/C_v$–4tml–2			5	S–FBO

		FORESTRY	WILDLIFE	RECREATION	ENGINEERING LIMITATIONS
REGION Z HARBOUR					
Z-1	 – $R_h//C_v/M_v-2lhmt-2$	U	S,E,M	5	S–FB
Z-2	 – $M_v/C_v/R_h-2lhtm-1$			5	S–FB
Z-3	 – $M_v/C_v/O-3tlhm-2$			5	S–FBO
Z-4	– $M_v/C_v/R_h-2lmht-2$			5	S–FB
REGION AA L'ANSE-AMOUR					
AA-1	 – $M_{vp}/W_e/F_t-4mhlt-1$	U	S	4	BX

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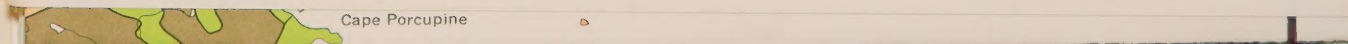
Landsat image taken 12 March, 1976 (201415-14423; picture centre 13-22; bands 4, 5 and 7). Knob Lake, Labrador is in the upper part of this winter image. The boundaries of this area's Ecological Land Regions (letters) and Districts (numbers) are overlain.

Placeholder for foldout insert to be shot at a later date.

UNIVERSITY OF TORONTO

Placeholder for foldout insert to be shot at a later date.


Cape Porcupine

LANDS DIRECTORATE (ATLANTIC REGION)
ENVIRONMENTAL MANAGEMENT SERVICE
FISHERIES & ENVIRONMENT CANADA
HALIFAX, NOVA SCOTIA